96-142

MATERIALS POLICY, RESEARCH, AND DEVELOPMENT ACT

HEARINGS

BEFORE THE

SUBCOMMITTEE ON ENERGY RESOURCES AND MATERIALS PRODUCTION

OF THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

NINETY-SIXTH CONGRESS

SECOND SESSION

ON

H.R. 2743

AN ACT TO PROVIDE FOR A NATIONAL POLICY FOR MATERIALS RESEARCH AND DEVELOPMENT AND TO STRENGTHEN THE MATERIALS RESEARCH AND DEVELOPMENT CAPABILITY AND PERFORMANCE OF THE UNITED STATES

JULY 29 AND 31, 1980

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MATERIALS POLICY, RESEARCH, AND DEVELOPMENT ACT

TUESDAY, JULY 29, 1980

U.S. SENATE,
SUBCOMMITTEE ON ENERGY RESOURCES
AND MATERIALS PRODUCTION,
OF THE COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 3110, Dirksen Office Building, Hon. Wendell H. Ford, presiding.

Present: Senators Ford and Bumpers.

Also present: Thomas L. Laughlin, professional staff member.

OPENING STATEMENT OF HON. WENDELL H. FORD, A U.S. SENATOR FROM THE STATE OF KENTUCKY

Senator FORD. Good morning, ladies and gentlemen, let's see if we can get started on time.

This morning's hearing is the first of two on the National Materials Policy Act of 1980, H.R. 2743. The second hearing will be held on July 31.

Senator John Melcher will be conducting that hearing.

I will place in the record the text of H.R. 2743 and I also have an extensive statement this morning which I will place in the record and also ask that the excellent report of the Materials Policy Division of the Congressional Research Service that was completed by them for the committee, be placed in the record at the end of my statement.

[The material follows:]

96TH CONGRESS
2D SESSION

H. R. 2743

IN THE SENATE OF THE UNITED STATES

DECEMBER 6 (legislative day, NOVEMBER 29), 1979

Read twice and referred to the Committee on Commerce, Science, and Transportation

JUNE 24 (legislative day, JUNE 12), 1980

Ordered, by unanimous consent, that if and when reported from the Committee on Commerce, Science, and Transportation, the bill then be referred to the Committee on Energy and Natural Resources for a period of not more than 30 calendar days in which to report or be deemed discharged (unless the 30-day period expires during a nonlegislative period, wherein the committee will have an additional 5 calendar days at the end of such period in which to report)

AN ACT

To provide for a national policy for materials research and development and to strengthen the materials research and development capability and performance of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Materials Policy, Research, and Development Act of 1979".

FINDINGS AND DEFINITION

SEC. 101. (a) The Congress finds and declares that—

(1) technological progress in the area of materials is essential for national well-being and security and to enable adaptation to (A) increasing dependence on foreign sources for essential industrial materials, (B) instability of materials markets, (C) international competition for materials, and (D) need for energy conservation and environmental quality;

(2) the United States lacks a coherent national materials policy and a coordinated program of materials research and development consistent with the goals and policies as set forth in the National Science and Technology Policy, Organization, and Priorities Act of 1976 (Public Law 94–282; 42 U.S.C. 6601 et seq.);

(3) extraction, production, processing, use, recycling, and disposal of materials are closely linked with national concerns for energy and environment;

(4) the United States is strongly interdependent with other nations through international trade in materials and other products; and

(5) notwithstanding the enactment of the Mining and Minerals Policy Act of 1970 and the directives and provisions contained therein to the Secretary of the Interior to carry out its provisions that Act has not been implemented resulting in the absence of a coherent national minerals policy.

(b) As used in this Act, the term "materials" means substances of current or potential use in the production of goods or services, with the exclusion of food and of energy fuels used as such.

DECLARATION OF POLICY

SEC. 102. The Congress declares it is the continuing policy of the United States to promote an adequate and stable supply of materials necessary to maintain the national well-being and security with appropriate attention to a long-term balance between energy, a healthy environment, natural resources conservation, full economic factors, and societal needs. Enactment of this policy requires that the United States Government, among other objectives, should—

(1) promote a vigorous and comprehensive program of materials research and development consistent with the policies and priorities set forth in the National Science and Technology Policy, Organization, and Priorities Act of 1976 (Public Law 94–282; 42 U.S.C. 6601 et seq.);

(2) establish a long-range assessment capability concerning materials needs, including the research and development necessary to meet those needs;

(3) establish a mechanism for the coordination of Federal materials research and development and for

the evaluation of materials research and development, Federal and private;

(4) promote cooperative research and development programs with other nations for the equitable and frugal use of materials and energy; and

(5) promote and encourage private enterprise in the development of economically sound and stable domestic materials industry, including but not limited to mining, minerals, metal and mineral recycling industries as well as the other goals and objectives as set forth in the Mining and Minerals Policy Act of 1970.

ACHIEVEMENT OF OBJECTIVES

SEC. 103. For the purpose of achieving the objectives set forth in section 102, the Congress declares that the Federal Government should—

(1) support basic and applied research and development to provide for (A) advanced technology for the exploration, discovery, and determination of nonfuel materials, (B) enhanced methods and processes for the use of renewable resources, (C) improved methods for the extraction, processing, recovery, and recycling of materials which encourage the conservation of materials, energy, and the environment, and (D) improved understanding of new and current materials perform-

ance, processing, substitution, and adaptability in engineering designs;

(2) provide for increased dissemination and effective communication, through existing private and professional channels and otherwise, of technical information and data resulting from research and development activities of Federal, State, and local governments and other sources as appropriate;

(3) assess the need for technically trained personnel necessary for materials research, development, and industrial practice;

(4) recommend appropriate measures to promote industrial innovations in materials and materials technologies; and

(5) encourage cooperative materials research and problem solving (A) by private corporations performing the same or related activities in materials industries and (B) by Federal and State institutions having shared interests or objectives.

IMPLEMENTATION

SEC. 104. Within one year after the enactment of this Act, the President shall submit to the Congress—

(1) a program to implement such proposals and organizational structures within the executive branch, existing or prospective, as he finds necessary to further

the policy and objectives as set forward in sections 102 and 103, with such proposals and organizational structures providing for the following minimum elements:

(A) policy analysis and decision determination within the Executive Office of the President;

(B) continuing private sector consultation in policy analysis; and

(C) interagency coordination at the level of the President's cabinet;

(2) recommendations for the collection and use of information concerning materials, including materials research and development; and

(3) recommendations for legislation to establish programs and institutional structures necessary for the implementation of a national materials research and development policy.

LONG-RANGE ASSESSMENT AND REPORT TO CONGRESS

SEC. 105. (a) In accordance with the provisions of the National Science and Technology Policy, Organization, and Priorities Act of 1976 (Public Law 94–282; 42 U.S.C. 6601 et seq.), the Director of the Office of Science and Technology Policy shall place special emphasis on the long-range assessment of national materials needs and the research and development, Federal and private, necessary to meet those needs. Pursuant to section 206 of that Act (42 U.S.C. 6615), the

Director shall assess national materials needs and technological changes over the next five years and where possible extend his assessment in ten-, twenty-five-, and fifty-year increments over the expected lifetime of such needs and technologies. Such assessment shall be revised annually and used in accordance with such section 206.

(b) The Federal Coordinating Council for Science, Engineering, and Technology shall exercise the functions vested in it under section 401(e) of the National Science and Technology Policy, Organization, and Priorities Act of 1976 (42 U.S.C. 6651(e)) in implementing and carrying out the policy and objectives established in this Act.

(c) The Secretary of Defense, together with the Secretary of the Interior and such other members of the Cabinet as are deemed necessary by the President, shall prepare in collaboration with the Director of the Office of Science and Technology Policy a report assessing critical materials needs related to national security and identifying the steps necessary to meet those needs. Such report shall be made available to the Congress within one year after the enactment of this Act. Thereafter, such assessment shall be revised annually, and shall be taken into account by the Director in making his assessments under subsection (a).

THE MINING AND MINERALS POLICY ACT OF 1970

SEC. 106. Nothing in this Act shall be interpreted as changing in any manner or degree the provisions and requirements of the Mining and Minerals Policy Act of 1970. For the purposes of achieving the objectives set forth in section 102, the Congress declares that the President shall direct the Secretary of the Interior to act immediately to attain the goals contained in the Mining and Minerals Policy Act of 1970.

AMENDMENT

SEC. 107. Section 209(a)(4) of the National Science and Technology Policy, Organization, and Priorities Act of 1976 (Public Law 94–282; 42 U.S.C. 6618(a)(4)) is amended by inserting after "problems" the following: ", including those involving materials,".

Passed the House of Representatives December 4, 1979.

Attest: EDMUND L. HENSHAW, JR.,

Clerk.

By BENJAMIN J. GUTHRIE,

Assistant to the Clerk.

STATEMENT OF SENATOR WENDELL H. FORD, CHAIRMAN
SUBCOMMITTEE ON ENERGY RESOURCES AND MATERIALS PRODUCTION
HEARING ON H.R. 2743
The National Materials Policy Act of 1980
July 29, 1980

This morning's hearing is the first of two on the National Materials Policy Act of 1980, H.R. 2743. The second hearing will be held on July 31.

H.R. 2743 was reported last week by the Committee on Commerce, Science and Transportation. The reported bill differs from the House-passed version in its greater emphasis on all aspects of the materials issue, rather than principally on research and development. Both the House bill and the Commerce Committee bill define "materials" as substances used for production of goods and services, exclusive of food and energy fuels. While this includes such items as forest products, the dominant theme of the discussions on the bill has been on nonfuel mineral policy. This is a policy for which this Committee is principally responsible and it is nonfuel minerals which will be the focus of the Subcommittee hearings.

Mineral shortages and supply interruptions caused by the Korean War led President Truman to appoint the "Paley Commission" to study the issue of reliable sources of minerals for the nation. The report, Resources for Freedom, was published in 1952. It is a detailed review of supply questions arising in connection with then-important mineral resources. That report has been followed by several other major government reports. The most recent comprehensive review was done by the National Commission on Supplies and Shortages established by Public Law 93-426 in response to concerns raised by the 1973 Arab oil embargo.

Recent Soviet and Cuban military actions in Africa have resulted in a re-emergence of the mineral supply issue. The United States is reliant on imports from African nations of several important minerals including cobalt, manganese, chromium and platinum-group metals. In addition, the alternative source of two of these -- chromium and platinum-group metals -- is the U.S.S.R. Attempted invasions of Zaire's mineral-rich Shaba province, together with rumors of large Soviet purchases on the London market of minerals produced by Zaire have fueled this concern.

While the United States is reliant on imports for a number of its minerals, most come from relatively reliable sources such as Canada and Australia. The most acute aspect of the minerals policy problem, then, appears to be a subgroup of critical minerals for which the U.S. is reliant on imports from insecure sources.

Several interrelated aspects of materials policy will be discussed at these hearings. They include: tax policy on virgin vs. recycled materials; freight rates and government subsidies for virgin and recycled materials; coordination of government research and development on substitutions, recycling, and conservation of resources in end use applications; mining and beneficiation research and development; training of manpower; access to Federal lands for mineral development; control of effects of mining on other land uses; mineral data programs; assessment of security of supply from foreign sources; and economic stockpiles.

The value of H.R. 2743, as I see it, will be to initiate a policy formulation process which will lead to a comprehensive national materials policy coordinating all these aspects.

The Congressional Research Service has prepared an excellent summary of mineral policy issues for the Committee. Without objection, I will place it in the record at the end of my statement.

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Washington, D.C. 20540

MINERALS POLICY ISSUES

Prepared for the
Senate Committee on Energy and Natural Resources

by
Alfred R. Greenwood
Specialist in Natural Resources Policy
Environment and Natural Resources Policy Division
June 1980

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Subcommittee Note.--Appendices A through G have been retained in the subcommittee's permanent files.

68-104 O—80—2

I. INTRODUCTION

This report provides a brief review of the principal materials policy studies initiated by Presidential or congressional directive begining with President Truman's Materials Policy commission (Paley Commission of 1952) and concluding with Phase I of President Carter's Non-Fuel Minerals Policy Review (1979). The report will focus on one aspect of materials policy - a discussion of various non-fuel mineral policy issues and options. No attempt will be made to address fuel minerals (coal, petroleum, natural gas), which have been the subject of intensive study and legislative activity since the imposition of the Arab oil embargo of 1973.

The policy issues in section IV of the report, dealing with the national defense stockpile; conservation, recycling, and substitution; Federal Government organization; and minerals and materials research and development were prepared by L. Harold Bullis, specialist in Science and Technology of the Science Policy Research Division. His contributions and assistance in providing useful suggestions for the balance of the report are very much appreciated.

One of the difficulties in addressing minerals and materials policy issues is the tendency to use the terms "materials" and "minerals" synonymously. This can be misleading. It should be noted that materials policy is much broader in scope. For example, the President's Materials Policy Commission Report (1952) defined materials as including non-fuel minerals, energy (fuel minerals), agriculture, industrial water, and timber. Recent definitions of "materials" are more limited but still include non-fuel minerals, forest products, natural and man-made fibers, and other chemical products, but exclude food, energy and drugs.

CRS-4

Minerals are both fuel and non-fuel. Non-fuel minerals include some 100 commodities such as copper, lead, bauxite, iron ore, zinc, gold, silver, cobalt, chromium, manganese, titanium, tin, nickel, and the platinum-group metals. Recent congressional concern has centered on the increasing U.S. dependence on foreign sources for these non-fuel minerals.

II. BACKGROUND

In the past, the abundant natural resource base of the United States provided the foundation for the nation's economic strength and an enviable standard of living for its citizens. About mid-twentieth century, however, the United States began to consume more materials than it produced. During the three decades since, there has been sporadic concern over minerals availability to meet the needs of the economy in the event of war, and more recently concerning our growing dependence on foreign sources for our supplies of energy and minerals during peacetime as well. During this period, there have been numerous commissions, congressional reviews, and Government and private industry studies which have attempted to analyze how the country can best provide for its materials and mineral requirements. There have been hundreds of issues raised and even more options and recommendations. For the most part, however, these recommendations have not prevailed in national policies and practices. Many of the issues addressed by the Paley Commission in 1952 are still issues today. While each of these studies had somewhat different assumptions and responded to a unique set of circumstances at that time, there is a considerable degree of overlap in issues addressed by the five major studies. The following is a brief review of those five major studies, and a complete summary of each appears in Appendix A.

THE PRESIDENT'S MATERIALS POLICY COMMISSION (1952)

World War II and the Korean War caused concern about the future U.S. ability to obtain the materials necessary to meet its national security requirements. As a result President Truman created a five member Presidential Commission in January 1951, headed by William S. Paley, President of the Columbia Broadcasting System. The Paley Commission was charged with making

recommendations as to how the U.S. and the free world would meet immediate defense needs in case of a national emergency and to consider the long-term (20-25 years) materials needs of the economy.

The President specifically directed the Commission to answer five broad materials questions:

* The long-range requirements outlook,
* the long-range supply outlook,
* the prospect and estimated extent of shortages,
* the consistency and adequacy of existing Government policies, plans, and programs, and
* the consistency and adequacy of private industry practices.

The five volume Commission report "Resources for Freedom" embodied several fundamental convictions including a commitment to continued economic growth, private enterprise solutions and limited Federal intervention, public and private cooperation, security and economic growth for the United States and the free world, and the fostering of a rising standard of living in those free nations on which the United States would depend for its increasing materials requirements. The Commission further assumed that the U.S. population would increase from 151 million in 1950 to 193 million by 1975, the workforce would grow during this same period from 62 to 82 million, and the demand for minerals would increase by 90 percent. The Commission concluded:

> Security and economic growth for the United States and the rest of the free world must be the essential aim of any policy worth the name. Materials strength is a prime ingredient of general economic strength and growth. This Commission is convinced that if the United States and other free nations are to have such strength they must coordinate their resources to the ends of common growth, common safety, and common welfare. In turn this means that the United States must reject self-sufficiency as a policy and instead adopt the policy of the lowest cost acquisition of materials wherever secure supplies may be found:

self-sufficiency, when closely viewed, amounts to a self-imposed blockade and nothing more.

It is by these avenues of thought that the Commission arrives at the formulation of the major premise upon which all the rest of its report is based.

The over-all objective of a national Materials Policy for the United States should be to insure an adequate and dependable flow of materials at the lowest cost consistent with national security and with the welfare of friendly nations. 1/

The Commission believed that a flexible policy response was needed to obtain this objective, taking into consideration the resources the Nation needed, where supplies were available domestically and internationally, and how the United States used its resources. The Commission recommended the following:

Increased Domestic Production. More materials should be obtained from domestic resources. This could be accomplished by:

* increased exploration and discovery,

* fuller use of known reserves,

* the development of new materials and substitution of abundant for scarce materials,

* conservation including improved product design to reduce unnecessary materials use and improve product durability, and

* the reuse of materials (recycling).

Imports. Materials should be obtained from abroad to meet the expected shortfall between U.S. demand and production. The Commission believed U.S. production would be able to meet 75 to 85 percent of demand over the next 25 year period (1950-1975). Import policy should be based on the following:

1/ Resources for Freedom, Summary of Volume 1 of a Report to the President by the President's Materials Policy Commission, Washington, D.C., U.S. Government Printing Office, 1952, p. 6.

a. supplies should be obtained at least cost,

b. U.S. should purchase supplies from secure sources,

c. U.S. should assist and encourage the development of foreign mineral industries. Where possible, multiple supplies for the same commodity should be developed to promote price stability and to insure access and availability.

d. To encourage imports of materials, the United States should eliminate tariffs and duties.

Mineral Information. The Department of Interior should strengthen its programs for collecting and analyzing mineral data, and a complete census of mineral industries should be taken every 5 years.

Mapping. The U.S. Geological Survey should accelerate the mapping of the U.S. and Alaska and develop a program to coordinate core drilling samples.

Basic Research. The National Science Foundation should lead an intensive program of basic research on methods of exploration for minerals.

Mineral Leasing. The alternative of leasing should be made available for all federally owned mineral deposits to which the location system applies. Several reforms should be made in the location system including the recording of all nonpatented claims, restriction of surface rights in future claims and patents to those needed for mining, and a 10-year limit to the holding of an unpatented claim.

Tax Policy. The depletion allowance should be retained and limitations on the expensing of exploration costs should be removed.

Stockpile of Strategic and Critical Materials. Stockpiling should be made a permanent instrument of U.S. policy and adequate funds should be provided for orderly purchases. The U.S. stockpile is not adequately stocked or provisioned to meet defense needs in case of war. No withdrawals from the stockpile should be authorized except during a declared emergency.

Federal Organization. An agency such as the National Security Resource Board, located in the Executive Office of the President, is needed to monitor and evaluate materials problems, programs and policies, and to report annually to the President with material policy guidance and recommendations.

PUBLIC LAND LAW REVIEW COMMISSION (1970)

The Commission was established by Public Law 88-606, and composed of Members of the House and Senate and included membership from county and state government, business, and academia. The Commission was chaired by Representative Wayne Aspinall, Chairman of the House Interior Committee. The Commission utilized the assistance of an advisory council with representatives from the Governors of the 50 states. The Commission was budgeted at $7.4 million and its staff spent almost four years preparing its report.

The Commission's Organic Act charged the Commission to report to the President and the Congress with recommendations of those actions, administrative or legislative, which should be taken to assure that the public lands of the United States would be retained and managed or disposed of in a manner providing the maximum public benefit.

The Commission's study program reviewed public land uses for the following commodities:

* timber, forage, energy fuels, non-fuel minerals, water, intensive agriculture, wildlife production, fish production, outdoor recreation, and land occupancy.

A summary of the Commission's recommendations as they apply to mineral resources follows:

Mineral development.

* Congress should continue to exclude some classes of public lands from future mineral development such as national parks, monuments, and similar areas possessing unique public values. However, the Commission cautioned against further mining exclusions in public areas unless mineral examinations had been made for the designated area.

* A program should be established to determine the extent of mineralization of the most promising public land areas where mineral activities are presently excluded.

* The Federal Government should generally rely on the private sector for mineral exploration, development, and production. Federal policy should continue the practice of encouraging exploration and development on public lands.

The General Mining Law of 1872.

* The 1872 law has been abused by individuals whose primary interest is not mineral development and production, but to use public lands for other purposes. In addition, the law offers no means by which the Government can effectively control environmental impacts.

* As a means of assuring exploration, rentals should be charged for claims, but actual expenditures for exploration and development credited against the rentals.

* Federal permits when issued to claimholders should include measures to protect the environment.

* When a claimholder begins production to market minerals, he should receive only a patent to the mineral deposit and surface rights necessary for production.

* Patent fees should be increased and equitable royalties paid to the United States on all minerals produced.

Administration of Mineral Activities

The Commission concluded that the Department of Interior should continue to have sole responsibility for administering mineral activities on all public lands.

Reservation of Mineral Interests

In future disposals of public lands for nonmineral purposes, all mineral interests of known value should be reserved for the United States. It should be noted that the Public Land Law Review Commission had three study volumes prepared dealing with non-fuel mineral resources and the public lands which included a description of the Nation's non-fuel minerals, their importance and use. One of the three volumes also discussed minerals and the mineral's environment.

NATIONAL COMMISSION ON MATERIALS POLICY (1973)

The National Commission on Materials Policy (NCMP) was established in October of 1970 under section 201 of the Resource Recovery Act (P.L. 91-512) and separately titled the "National Materials Policy Act of 1970". Section 202 cites the objectives of the Act as follows:

> It is the purpose of this title to enhance environmental quality and conserve materials by developing a national materials policy to utilize present resources and technology more efficiently, to anticipate the future materials requirements of the Nation and the world, and to make recommendations on the supply, use, recovery, and disposal of materials.

The Act further authorized the President to appoint seven members from the government and the private sector and to hire staff and consultants. The Commission was authorized $2 million for its work which was completed over a

2 1/2 year period. The Commission made 198 separate recommendations and reached several broad summary findings. The Commission concluded that the development of a national materials policy required consideration of all natural resources: materials, energy, and the natural environment. In this regard, the Commission defined materials as natural resources intended to be utilized by industry for the production of goods, excluding foods. They listed three major directives for policy makers:

* Strike a balance between the "need to produce goods" and the "need to protect the environment" by modifying the materials system so that all resources, including environmental, are paid for by the users.

* Strive for an equilibrium between the supply of materials and the demand for their use by increasing primary materials production and by conserving materials through accelerated waste recycling and greater efficiency-of-use of materials.

* Manage materials policy more effectively by recognizing the complex interrelationships of the materials - energy - environment system so that laws, executive orders, and administrative practices reinforce policy and not counteract it.

The report included considerable data and information, statistics and graphical illustrations including projections for United States and world material requirements. These projections included materials for which the United States was becoming increasingly dependent on foreign sources. The Commission concluded that there would be sharp increases in the demand for materials over the next 25-year period. The Commission also pointed out that the United States used nearly 30 percent of the world mineral production (1970) and this percentage would remain relatively constant (27 percent) through the year 2000.

An important assumption made by the Commission was the belief that materials flow through a closed materials system. The Commission stated this as follows:

> Materials flow through a system, which is made up of materials, energy, and the natural environment and is governed by man-made institutions such as production, consumption, technology, transportation, and government. What is significant about the interaction between the parts is that they compose a materials system; they function like a system and have to be treated by policy makers as a system. 2/

The Commission's final report contained 12 chapters addressing such subjects as the role of materials in American life, the materials system, supply, use, recovery, disposition of waste, energy and materials, environmental factors in materials policy, land and water use, international aspects, and organizational considerations.

Individual recommendations were made in each of the above noted subject areas. (A compendium of recommendations is attached in Appendix A, together with the summary of the Commission report.)

The following are some of the more important recommendations as they apply to non-fuel minerals.

Domestic Mineral Supply. Increased production of minerals from the public lands should be encouraged and the Mining and Minerals Policy Act of 1970 should be implemented. There should be public lands legislation which would assure that land is used to optimize its future mineral contributions, provide Federal support for university research in earth sciences, retain the percentage depletion to encourage mineral discovery and development, legislative language to permit exploration under regulations which would prevent irreparable damage to protected areas, evaluation of the costs and benefits of mining development, and an increase of funds for Federal Government

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2/ National Commission on Materials Policy. Materials needs and the Environment, Today and Tomorrow: Final Report, Washington, U.S. Government Printing Office, 1973, p. 4A-3.

exploratory efforts. The Commission also favored an international agreement on deep seabed mining to provide supplies of several minerals to lessen U.S. import dependence.

Foreign Dependence and National Security. U.S. economic policy should rely on market forces to determine the extent of domestic production and reliance on imports. However, such a policy should be subject to considerations such as the health and viability of the domestic materials industry, national security, and fair international competition. They cautioned that the U.S. Government must take action when it becomes apparent that foreign dependence on specific commodities is dangerous to the economy because of price or market unavailability. In those instances where problems are evident, the Commission recommended U.S. action to promote the expansion of domestic production, diversification of supply sources, development of special relations with more reliable sources, development of substitutes for scarce materials, and provision for a mechanism to allocate existing supplies.

Mining Law. A number of substantial revisions should be made in the Mining Law of 1872 to include language to protect environmental values, retain surface rights for the Federal Government, provide for the collection of royalties on mineral production, and authority to terminate rights to publicly owned minerals if the holder was found to be in substantial violation of mining laws or regulations. The Commission urged Congress to require compliance with the Mining and Minerals Policy Act of 1970 in any new legislation relating to materials policy. The President was also urged to require executive agencies to adhere to the Act.

Public Lands. Public land policy should include the principal of multiple use, the promotion of exploration for scarce minerals, and the completion of mineral surveys for areas before decisions are made to withdraw Federal lands from exploraton and development. In addition, the Commission advocated increased funding for the U.S. Geological Survey and the Bureau of Mines for mineral exploration.

Tax Policy. The percentage depletion should be continued as a major incentive to discovery and development of mineral resources and the total cost of mineral exploration and development should be fully deductible.

Antitrust. Antitrust restrictions should be eliminated (Sherman Act) to permit special industry groups to form joint venture arrangements for production to meet economies of scale.

Investment Capital. A financial institution should be established similar to the Reconstruction Finance Corporation, which could provide low interest investment loans to industry to encourage production following a determination of national need.

Federal Procurement and Market Guarantees. Legislation should be enacted similar to the Defense Production Act provisions providing Federal procurement and market guarantees to encourage domestic production to meet crucial national requirements.

Conservation and Resource Recovery. Consumer product standards should be set to improve the efficiency of minerals use. A national resource recovery system should also be established to discourage dumping and encourage resource recovery, and to create markets for recovered materials by recyling. Incentives for recycling would include Federal procurement policies, and equitable treatment of secondary materials in areas of tax policy and freight rates.

Federal Organization. A cabinet level Department of Natural Resources is needed to assure a comprehensive and coordinated approach to the development of public policy for materials, energy, and the environment. As an interim arrangement, there should be a temporary natural resources coordinating committee at the highest policy level in government. In addition, there should be a joint committee of the Congress with jurisdictional authority over natural resources to prevent the problem of conflicting policies.

NATIONAL COMMISSION ON SUPPLIES AND SHORTAGES (1976)

The Commission was established by Public Law 93-426 on September 30, 1974, as an amendment to the Defense Production Act in response to concerns about widespread metal shortages and price increases resulting from the Arab oil embargo, of mineral commodities such as aluminum, copper, and titanium. The Commission was composed of 13 members including two members each from the House and Senate, the Chairman of the Council of Economic Advisers, the Director of the Office of Management and Budget, the Secretary of the Treasury, the Assistant to the President for Economic Affairs, and several members from academic institutions. The Commission was chaired by Donald B. Rice, President of Rand Corporation and was authorized approximately $1.5 million for the conduct of its operations and printing of its final report. The Commission submitted its report to the President and the Congress in December 1976.

The congressional findings outlined in P.L. 93-426 included five concerns: 1) The United States is becoming increasingly dependent on foreign nations for certain natural resources vital to the U.S. economy; 2) these nations, alone or in concert, could arbitrarily raise prices; 3) shortages of resources and

commodities are increasing in the U.S.; 4) existing institutions do not adequately identify and anticipate such shortages; and 5) data important to anticipating such shortages is not systematically coordinated and disseminated.

The statute charged the Commission with functions very similar to those of the Paley Commission some 23 years earlier:

> It shall be the function of the Commission to make reports to the President and to the Congress with respect to:
>
> (1) the existence or possibility of any long- or short-term shortages; employment, price or business practices; or market adversities affecting the supply of any natural resources, raw agriculture commodities, materials, manufactured products (including any possible impairment of productive capacity which may result from shortages in materials, resources, commodities, manufactured products, plant or equipment, or capital investment, and the causes of such shortages, practices, or adversities);
>
> (2) the adverse impact or possible adverse impact of such shortages, practices, or adversities upon consumers, in terms of price and lack of availability of desired goods;
>
> (3) the need for, and the assessment of, alternative actions necessary to increase the availability of the items referred to in paragraph (1) of this subsection, to correct the adversity or practice the availability of any such items, or otherwise to mitigate the adverse impact of shortages, practices, or adversities upon consumers referred to in paragraph (2) of this subsection;
>
> (4) existing policies and practices of Government which may tend to affect the supply of natural resources and other commodities;
>
> (5) necessary legislative and administrative actions to develop a comprehensive strategic and economic stockpiling and inventories policies which facilitates the availability of essential resources;
>
> (6) the means by which information with respect to paragraphs (1), (2), (3), (4) of this subsection can be most effectively and economically gathered and coordinated."

The Commission report concluded that the world was not on the verge of resource exhaustion since world resources are immense, even though proved reserves of various commodities would seem to indicate that only a few years of supply remain.

With respect to dependence on foreign imports of commodities, the Commission noted that the Arab oil embargo had created a shortage mentality. However, the Commission noted that U.S. dependence for non-fuel minerals had increased only modestly with a gradual growth in imports expected in the near future. The Commission also pointed out that there were few nations who were mineral self-sufficient and the U.S. dependence was substantially less than most other industrialized nations. However, the Commission warned that the United States must be prepared to protect itself against the effects of supply interruptions, including such means as the establishment of economic stockpiles.

The Commission also felt that the Government's capacity for comprehensive long-term planning was weak, requiring improvements in materials data collection, data analysis, and policy analysis at the White House and the departmental level. Further conclusions and recommendations included:

Foreign dependence. There is no immediate danger of a squeeze on non-fuel minerals similar to the Arab oil embargo. Collusion and monopoly pricing can be effective for few, if any, of these non-fuel minerals. The risks of dependence on non-fuel mineral imports is exaggerated and the possibility of trade embargoes is remote.

Economic Stockpiles. The stockpile of strategic and critical materials should be enlarged as proposed by the Ford Administration. In addition, the stockpile should be available for economic purposes to meet severe disruptions in the supply of a critical material. However, the stockpile should not be used to influence material prices in the absence of an actual or threatened supply interruption.

Tax Policy. The percentage depletion allowance should be repealed. The loss of Federal revenues for this tax subsidy is estimated at $850 million

in FY 1977. This is unwarranted since the marginal price effect of the subsidy appears to be negligible.

Recycling. As a percentage of total consumption, recyling has been static or declining and only a small portion of waste is recycled. The present rates of recycling can be increased substantially to lessen the burden on production of virgin minerals. Recycling should be encouraged by internalizing the cost of product disposal charges and equalization of the freight rates charged for recycled materials as compared to virgin materials. However, no tax subsidies should be created for the consumption of recyled materials.

Materials Research and Development. It is estimated that direct Federal expenditures for materials R&D amounted to $764 million in FY 1976. The management of the current government R&D effort should be improved to provide for more timely development and introduction of new materials technology. For this to be effective, the government R&D program must be coordinated with industry to meet their needs.

Federal Organization. An independent agency such as a National Growth and Development Commission, composed of public and private members should be created to select mid-term and long-term policy issues for comprehensive analysis. Industry and sectorial analysis capabilities should be strengthened within the Office of Management and Budget and the Council of Economic Advisors to provide policymakers with information concerning the possible ramifications facing an industry or sector resulting from a proposed policy or action.

A Department of Natural Resources should be established and the Committees of Congress restructured and consolidated to oversee the policies and programs of this new department.

NONFUEL MINERALS POLICY REVIEW (1979)

A nonfuel mineral policy review was requested in a February 1977 letter to President Carter from 43 Members of the House of Representatives. The letter expressed concern about the Nation's deteriorating nonfuel mineral position and the need for a balanced national policy for long term non-fuel minerals planning. This was followed by a meeting with President Carter on the subject in June 1977. In December 1977, the President ordered a review of non-fuel minerals policy and established a Policy Coordinating Committee (PCC) chaired by Interior Secretary Cecil Andrus. The PCC was composed of 13 other cabinet secretaries, agency administrators, and Presidential advisors.

The study was divided into two phases, one of problem identification and a second which would provide policy options for the Presidnet's consideration. The report was scheduled to be completed within 15 months. However, a number of difficulties including a lack of funding and staffing dependent on the details of personnel from other agencies plagued the start-up of the Presidential review. The problem or issue identification phase took nearly two years, and a final draft was not printed for public review until August 1979.

The problem areas determined to pose the most significant difficulties for non-fuel mineral commodities were characterized as follows (with lead agencies in parentheses):

* major minerals supply problems (Minerals Review Committee);
* availability of foreign minerals to the United States and its allies (Department of State);
* relationship of environmental quality, health and safety and the price and availability of minerals (Environmental Protection Agency);
* the minerals resource potential of Federal lands (Department of the Interior;

* financing, capital formation, and tax policies (Department of the Treasury);
* recycling, conservation, and substitution (Department of Commerce);
* competitiveness of U.S. minerals industries (Department of the Interior);
* adequacy of minerals-related research and development (National Science Foundation); and
* adequacy of existing government capabilities to support Federal policy-making (Department of the Interior).

It should be noted that certain issues were excluded from consideration because administration policy had already been firmly established in those areas. These included the Alaska lands legislation, revision of the 1872 mining law, deep seabed mining legislation, "trigger price" mechanisms for steel imports, and strategic stockpile policy.

The draft report examined twelve nonfuel mineral commodities in detail - asbestos, chromium, cobalt, copper, iron ore and scrap, lead, manganese, nickel, phosphate, silver, and zinc. These commodities were felt to be representative of nonfuel minerals impacted by the problems identified for review. Since Phase I of the Non-fuel Minerals Policy Review involved only problem identification, the draft report does not provide policy recommendations. The following are the preliminary findings of the review.

Foreign Supply Dependence

Imports of nonfuel minerals for both raw and processed materials increased from $9 billion in 1973 to $21 billion in 1978. Although the United States produces about 25 percent of the world's raw and processed mineral output ($200 billion in 1978), net imports provide more than 50 percent of U.S. consumption for 20 important mineral commodities. The United States is 90 to 100 percent dependent for nine of these commodities. It is projected

that future supplies of chromium (92%), manganese (98%), cobalt (97%), and the platinum group (91%) imported from abroad are becoming less secure.

Domestic Minerals Production

By the year 2000, several of the domestic mineral industry segments are expected to experience declining production. These include bauxite mining, aluminum refining, aluminum smelting, ferrochrome smelting, lead mining and smelting, and zinc mining and smelting.

Factors contributing to this decline are ore quality, labor costs, technology, foreign government subsidies to their industries, energy costs, management, and U.S. government policies such as environmental, health, and safety regulations.

Environmental, Health and Safety Regulations

The impact of these regulations is having a substantial economic impact on the copper, lead, asbestos, phosphates, and iron and steel industries since they contribute a substantial proportion of the national total of certain pollutants. The higher costs associated with meeting these regulations is causing significant price increases, capacity decreases, and job losses, and is resulting in increased reliance on foreign imports.

Federal Land Management

Thirty-two percent of nonfuel mineral production occurs on Federal lands. However, over 40 percent of Federal lands (304 million acres) are closed to mineral entry because of withdrawals for national parks, wilderness areas, military reservations, energy facilities, etc. An additional 25 percent of the Federal lands (190 million acres) are highly or moderately restricted. Therefore, only 266 million acres of the 760 million acres of Federal land are fully opened to mineral activities.

Policy-making and Policy Analysis Capabilities

The Federal nonfuel mineral policy-making process is adhoc and often conducted without adequate coordination. There is no coordinating mechanism for involving Federal officials with mineral policy responsibility or those in other agencies with similar responsibilities for environmental, tax, or other national policies which may impact or conflict with nonfuel mineral policy.

Coordination is complicated by the fact that there are 20 Federal departments, agencies, etc. whose policies affect nonfuel mineral supply and consumption. In addition, they administer over 80 different laws, executive orders, and regulations dealing with nonfuel minerals.

In addition, there are shortcomings in the availability and validity of nonfuel mineral data and the analytical capabilities available to analyze such data.

III. MINERALS AVAILABILITY AND FOREIGN DEPENDENCE

The question of availability of mineral supplies to meet U.S. economic and strategic needs during war and peacetime has been the subject of every major study of materials and minerals policy since World War II. As noted previously, the Paley Commission concluded in 1952 that it should be U.S. policy to increase its reliance on secure foreign sources at the least cost for imports necessary to meet U.S. requirements. This adherence to economic principles and reliance on private enterprise to provide minerals to the U.S. economy has been a continuing U.S. policy.

In discussing import dependence, the National Commission on Supplies and Shortages noted in 1976:

> An obvious, but sometimes forgotten, point is that the United States imports nonfuel minerals, along with some $100 billion worth of other goods, because the Nation and its citizens gain economic advantages--lower costs and higher real incomes--thereby. It would make no national economic sense to forego those advantages unless there were compelling national reasons for doing so. Import dependence, in other words, is not a problem as such; for example, it is simply misleading to cite a U.S. "deficit" in the minerals trade as though this represented in some pertinent sense a national loss. 3/

In 1979, U.S. production of raw nonfuel minerals totaled $24 billion. The estimated value to the U.S. economy in 1979 of processed material of nonfuel mineral origin increased to $225 billion from $200 billion in 1978.

Imports of mineral raw materials totaled $4 billion in 1979 (up from $3 billion in 1978) and imports of processed materials of nonfuel mineral origin were valued at $20 billion (up from $18 billion in 1978 and only $7 billion in

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3/ Government and the Nation's Resources, Report of the National Commission on Supplies and Shortages, 1976, p. 30.

1973). U.S. exports of mineral raw materials and processed materials were valued at $21 billion (up from $13 billion in 1978). 4/

Most recent studies conclude that there are adequate supplies from secure foreign sources to meet most U.S. mineral needs during peacetime. In addition, national emergency needs are stockpiled in the National Defense Stockpile. However, there is disagreement as to the adequancy of certain commodities. Imports of nonfuel minerals come mainly from Canada, Austrialia, Brazil, and South Africa. Canada alone accounts for about one-third of U.S. nonfuel imports. In addition, deep seabed mining offers the potential for vast quantities of manganese, cobalt, nickel, and copper.

The 1980 Mineral Commodity Summaries published by the U.S. Bureau of Mines lists 91 categories of nonfuel mineral commodities. Of these, the United States is a net exporter of 18, self-sufficient in 7, and a net importer of 66.

As can be seen from the following chart (p. CRS-26), the United States is more than 50 percent dependent for 19 commodities including titanium (100), manganese (98), chromium (90), cobalt (90), and the platinum group metals (89).

It is this reliance on foreign imports for this group of 19 commodities that has been of such concern during the last decade. The Nonfuel Minerals Policy Review concluded in 1979 that of 21 mineral industries examined, eleven are expected to lose a portion of their share of the U.S. market by the year 2000. An increasing share of the U.S. market is expected in only four commodities. Declines are projected in bauxite mining, aluminum refining, aluminum smelting, zinc mining and smelting, and silver refining. An obvious, but important finding of the study also notes that future supplies of several imported minerals

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4/ Bureau of Mines data, 1979.

CRS-26

U.S. NET IMPORT RELIANCE OF SELECTED MINERALS AND METALS AS A PERCENT OF CONSUMPTION IN 1979[1/]

MINERALS AND METALS 2/
NET IMPORT RELIANCE* AS A PERCENT OF APPARENT CONSUMPTION**
0% 25% 50% 75% 100%
MAJOR FOREIGN SOURCES 3/ (1975-1978)
COLUMBIUM 100 BRAZIL, CANADA, THAILAND
MICA (sheet) 100 INDIA, BRAZIL, MADAGASCAR
STRONTIUM 100 MEXICO, SPAIN
TITANIUM (RUTILE) 100 AUSTRALIA, JAPAN, INDIA
MANGANESE 99 SOUTH AFRICA, GABON, BRAZIL, FRANCE
TANTALUM 99 THAILAND, CANADA, MALAYSIA, BRAZIL
BAUXITE & ALUMINA 93 JAMAICA, AUSTRALIA, GUINEA, SURINAM
CHROMIUM 90 SOUTH AFRICA, U.S.S.R., S. RHODESIA (ZIMBABWE), TURKEY
COBALT 90 ZAIRE, BELG.-LUX., ZAMBIA, FINLAND, CANADA
PLATINUM — GROUP METALS 85 SOUTH AFRICA, U.S.S.R., UNITED KINGDOM
ASBESTOS 85 CANADA, SOUTH AFRICA
TIN 81 MALAYSIA, THAILAND, INDONESIA, BOLIVIA
NICKEL 77 CANADA, NORWAY, NEW CALEDONIA, DOMIN. REP.
CADMIUM 66 CANADA, AUSTRALIA, MEXICO, BELG.-LUX.
POTASSIUM 66 CANADA, ISRAEL
MERCURY 62 ALGERIA, SPAIN, ITALY, CANADA, YUGOSLAVIA
ZINC 62 CANADA, MEXICO, HONDURAS, SPAIN
TUNGSTEN 59 CANADA, BOLIVIA, REP. OF KOREA
GOLD 56 CANADA, U.S.S.R., SWITZERLAND
TITANIUM (ilmenite) 46 AUSTRALIA, CANADA
SILVER 45 CANADA, MEXICO, PERU, UNITED KINGDOM
ANTIMONY 43 SOUTH AFRICA, CHINA MAINLAND, MEXICO, BOLIVIA
BARIUM 40 PERU, IRELAND, MEXICO, MOROCCO
SELENIUM 40 CANADA, JAPAN, YUGOSLAVIA, MEXICO
GYPSUM 33 CANADA, MEXICO, JAMAICA
IRON ORE 28 CANADA, VENEZUELA, BRAZIL, LIBERIA
IRON & STEEL SCRAP (22) NET EXPORTS
VANADIUM 25 SOUTH AFRICA, CHILE, U.S.S.R.
COPPER 13 CANADA, CHILE, ZAMBIA, PERU
IRON & STEEL PRODUCTS 11 JAPAN, EUROPE, CANADA
SULFUR 11 CANADA, MEXICO
CEMENT 10 CANADA, MEXICO, NORWAY, BAHAMAS
SALT 9 CANADA, MEXICO, BAHAMAS
ALUMINUM 8 CANADA
LEAD 8 CANADA, PERU, MEXICO, HONDURAS, AUSTRALIA
PUMICE & VOLCANIC CINDER 4 GREECE, ITALY
0% 25% 50% 75% 100%

*NET IMPORT RELIANCE = IMPORTS-EXPORTS ±ADJUSTMENTS FOR GOV'T AND INDUSTRY STOCK CHANGES.

**APPARENT CONSUMPTION = U.S. PRIMARY +SECONDARY PRODUCTION + NET IMPORT RELIANCE.

1/ EST. DEC. 14, 1979

2/ SUBSTANTIAL QUANTITIES ARE IMPORTED FOR FLUORSPAR, GRAPHITE, RHENIUM AND ZIRCON. DATA WITHHELD TO AVOID DISCLOSING COMPANY PROPRIETARY DATA.

3/ SOURCES SHOWN ARE POINTS OF SHIPMENT TO THE U.S. AND ARE NOT NECESSARILY THE INITIAL SOURCES OF THE MATERIAL

BUREAU OF MINES, U.S. DEPARTMENT OF THE INTERIOR
(import-export data from Bureau of the Census)

critical to the United States and its allies are becoming less secure, with chromium, manganese, cobalt, and the platinum-group metals of greatest concern. Current sources for these minerals include Africa and the Soviet Union. The following table (p. CRS-28) from that study outlines current and potential U.S. dependence for these sources. There have been reports that the Carter Administration is currently studying policy options which would address the question of U.S. dependence on Africa for imports of these minerals.

As a part of the Nonfuel Minerals Policy Review, the Department of State addressed Problem Area 2 - availability of foreign minerals to the United States and its allies. While not publicly released, this report surveyed potential mineral problems around the world and its conclusions formed the basis for the concerns expressed about potentially insecure sources for these important minerals. The report also noted:

> Major industrial countries of the OECD, the principal consumers of nonfuel minerals, generally share the view that physical shortages of these minerals are not likely in this century. As a current Central Intelligence Agency analysis points out, the world's inventory of proven reserves has constantly increased over the years through the discovery of new minable deposits, price increases which provide incentives to expand exploration and output, and the development of technology allowing the exploitation of previously uneconomic deposits.

It should be noted that the United States is relatively self-sufficient when compared to Japan and Western Europe. For example, the Federal Republic of Germany is 100 percent import dependent for 16 important minerals including tin, aluminum, tungsten, nickel, titanium, molybdenum, vanadium, antimony, mercury, platinum-group metals, manganese, chromite, uranium, asbestos, magnesite, and phosphate. They are also heavily import dependent on copper (99.8), iron (93), and lead (87), and zinc (68).

Indications of Current and Potential U.S. Dependence on Central and Southern African Nations and the U.S.S.R.
(All data is for 1978 unless otherwise indicated)

	Chromium (Thousand Short Tons)	Cobalt (Short Tons)	Manganese (Thousand Short Tons)	Platinum-Group (Thousand Troy Ounces)
U.S. Consumption % imported	590 92 *	9,433	1,415 98 *	2,318 ** 91 *
Anticipated demand growth Annual rate to 1985 Expected 1985 demand	5.4% 746	2.9% 11,522	1.6% 1,581	4% 3,133
Import Sources (1974-1977 average)	Chromite: South Africa 35% USSR 18% Ferrochrome: South Africa 36% Rhodesia 23%	Zaire 65% Zambia 7%	Manganese Ore: Gabon 36% South Africa 9% Ferromanganese: South Africa 30%	South Africa 42% USSR 26%
Reserves	World Total: 3,700,000 South Africa 2,500,000 Rhodesia 1,100,000	World Total: 1,600,000 Zaire 500,000 Zambia 125,000 USSR, Cuba 350,000	World Total: 6,000,000 South Africa 2,200,000 Gabon 165,000 USSR 3,000,000	World Total: 790,000 South Africa 580,000 USSR 200,000
Resources ***	World Total: 36,000,000 South Africa 25,000,000 Rhodesia 10,000,000	World Total: 5,000,000 Zaire 1,000,000 Zambia 640,000 USSR, Cuba 1,400,000	The USSR and South Africa account for more than 80% of identified world resources.	World Total: 2,800,000 South Africa 2,000,000 USSR 400,000 Rhodesia 100,000
Substitutes and Alternates	Nickel, zinc, cadmium, aluminum, cobalt, molybdenum, vanadium, and titanium in various uses with either higher cost or some sacrifice in performance standards.	Nickel, but only with a loss of effectiveness; platinum, tungsten, and ceramics in various uses.	No substitutes exist for major applications.	Gold, silver, and tungsten in electrical/electronic uses; improved engines or fuels could reduce use in emission control catalysts in autos.

* Remainder of consumption supplied from recycled material or stocks.
** Does not include approximately one million ounces of toll-refined secondary.
*** Excludes deep-sea resources of cobalt and manganese in the form of manganese nodules.

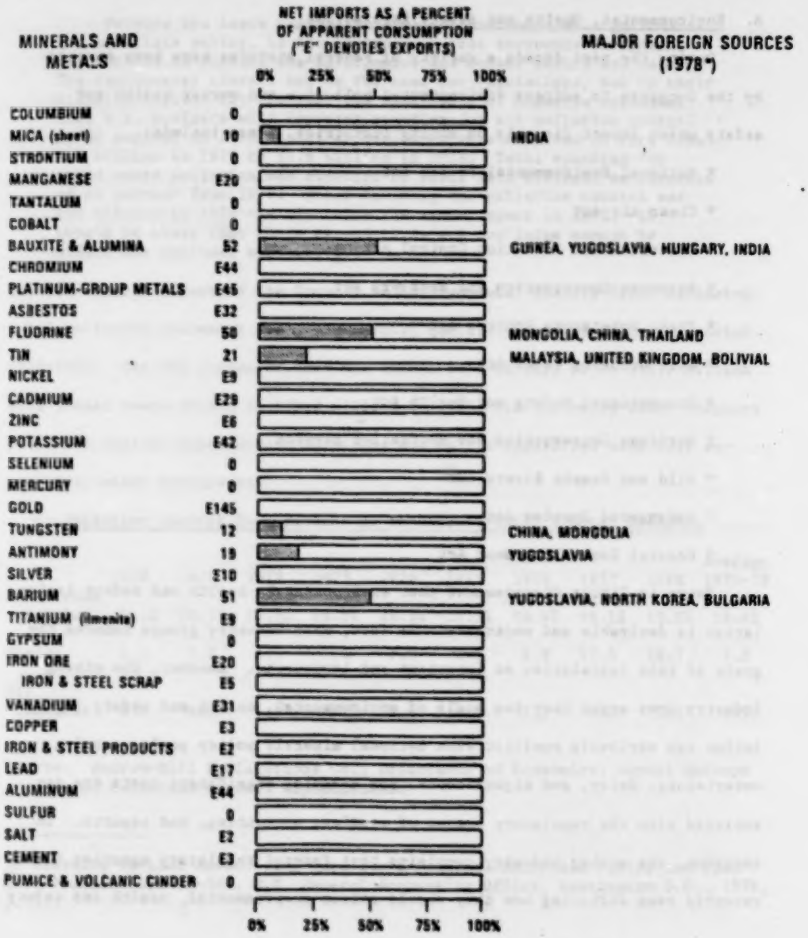
Source: U.S. Bureau of Mines, Commodity Data Summaries, 1979.

However, in comparison with the Soviet Union, the United States does not do nearly so well. The Soviets are 50 percent dependent on imports for only three commodities - bauxite and alumina, fluorine, and barium. The following chart (p. CRS-30) depicts Soviet net imports of selected minerals and metals for 1978.

As a number of studies have indicated, it is critical for the United States to have secure sources for vital imports. In those cases where curtailments of supply is possible because of political instability or other political or economic considerations, these same studies have suggested that special Government actions be taken, including stockpiling and incentives to increase domestic production of these threatened commodities.

CRS-30

U.S.S.R. NET IMPORTS OF SELECTED MINERALS AND METALS AS A PERCENT OF CONSUMPTION IN 1978*



*ESTIMATE—MARCH 1979

BUREAU OF MINES, U.S. DEPARTMENT OF THE INTERIOR

IV. NONFUEL MINERAL POLICY ISSUES

A. Environmental, Health and Safety Regulations

During the past decade a variety of Federal statutes have been enacted by the Congress to address environmental pollution and worker health and safety which impact directly on mining industries. These include:

* National Environmental Policy Act
* Clean Air Act
* Federal Water Pollution Control Act
* Resource Conservation and Recovery Act
* Toxic Substances Control Act
* Safe Drinking Water Act
* Occupational Safety and Health Act
* Heritage Conservation and Recreation Service
* Wild and Scenic Rivers Act
* Endangered Species Act
* Coastal Zone Management Act

There is little disagreement that environmental, health and safety legislation is desirable and necessary. In fact, most industry groups endorse the goals of this legislation as important and legitimate. However, the mining industry does argue that the goals of environmental, health and safety legislation can seriously conflict with national minerals policy goals, causing uncertainty, delay, and higher costs. For example, significant costs are associated with the regulatory burden of studies, accounting, and reports. In addition, the mining industry complains that Federal regulatory agencies have recently been dictating how they should attain environmental, health and safety

standards rather than allowing the industry to determine the most cost effective and innovative approach. A recent GAO study concluded:

> Perhaps the issue having the greatest contemporary significance for materials policy, is the controversy that surrounds Government regulations to protect the environment and worker health and safety. The controversy centers not on the need for regulations, but on their relative costs. For example, the Department of Commerce estimates that U.S. business will increase spending for air pollution control by 30 percent in 1978; total expenditures were expected to rise from 4.5 billion in 1977 to $5.9 billion in 1978. Total spending for solid waste pollution was expected to reach $1.1 billion, an increase of 64 percent from 1977. Total spending for pollution control was $35 billion in 1976--nearly twice the amount spent in 1972. It should be clear that these expenditures are now large enough to affect the national economy. 5/

The 1979 Annual Report of the Council on Environmental Quality (CEQ) estimated total pollution abatement and environmental quality expenditure for the period 1978-1987. The CEQ estimated that the annual cost in 1978 to be $46.7 billion with annual costs rising to $94.2 billion by 1987. The following table compares pollution control expenditures of mining and metals industries with that expended by other businesses.

Pollution Control Expenditures as Percent of Total Capital Spending

	1970	1971	1972	1973	1974	1975	1976	1977	1978	Average 1970-78
Nonferrous metals	8.1%	10.3%	15.3%	18.0%	28.3%	27.5%	20.4%	29.1%	12.0%	18.8%
Mining	6.1	2.8	5.1	7.6	7.0	8.2	6.9	17.5	10.7	7.9
All business	3.1	4.0	5.1	5.7	6.2	6.8	7.1	6.7	5.2	5.5

Source: McGraw-Hill Publications Co., Department of Economics, Annual Surveys of Pollution Control Expenditures.

5/ Learning to Look Ahead: The Need for a National Materials Policy and Planning Process (EMD-79-30), U.S. General Accounting Office, Washington D.C., 1979, p. 37.

The Nonfuel Minerals Policy Review examined the impact of environmental, health and safety regulations on the nonfuel minerals industry and determined that the economic impact is substantial and increasing (estimated to range from 8 to 16 percent of production costs by 1985 for copper, lead, and phosphate industries) as current statutes and new regulations are applied and enforced.

The National Commission on Supplies and Shortages (1976) held the view that polluting industries should absorb the cost of pollution-abatement expenditures and recapture these costs through higher prices to users. However, this could have a severe impact on domestic companies competing with foreign producers whose governments either impose no environmental restrictions or provide funds to help offset expenditures for pollution abatement to meet environmental standards. Consequently, these foreign firms have a competitive advantage. While the United States has endorsed the principle of free trade, mining industry critics contend that foreign producers do not operate under the same rules as U.S. companies and therefore U.S. interests are suffering, causing increased dependence on foreign sources and weakening domestic industries.

At the same time, there are those who argue that U.S. environmental, health and safety legislation is promoting foreign rather than domestic investment and production, and in effect exporting hazardous factories to developing nations. The GAO made note of shifting mineral investment in a 1979 study of the U.S. mining industry:

> Shifts in mineral sector investment due to regulatory constraints could benefit countries whose approaches to regulations are more flexible or willingness to support the additional costs may give projects cost advantages. For example, several countries, including Australia, the Philippines, Brazil, Venezuela, Sweden, West Germany, and Ireland give high priorities to the costs and practical consequences of environmental standards in determining

the extent to which they will be enforced. Norway, Sweden, and West Germany also provide financial support for new equipment needed for environmental protection. 6/

As a means of equalizing the situations noted above, legislation was introduced in the 95th Congress which would have imposed a $.10 per pound environmental equalization tariff on imports not meeting U.S. environmental standards. Other suggestions include streamlining environmental clearance procedures to shorten the delays in project construction. For example, environmental clearances for a steel mill in Japan (a nation with strict environmental standards) generally requires two years as compared to four years in the United States. The increased construction costs associated with delays of this kind can kill a once viable project.

The mining industry has suggested that regulatory agencies be required by statute to consider alternative regulatory approaches, to find the least burdensome alternatives. Such a process would involve the analysis of costs and benefits which would include national security implications as well as social goals. It is suggested that congressional oversight of agency actions would provide the enforcing mechanism on the regulatory agencies.

B. Federal Land Management

The Federal Government owns and manages over 760 million acres, about one-third of the land area of the United States (2.17 billion acres). Most of this was in the public domain and never owned by private individuals, while 60 million acres was acquired by the Government. The Bureau of Land Management and the Forest Service control about 85 percent of Federal lands. The BLM manages approximately 470 million acres including 295 million acres in Alaska. However,

6/ The U.S. Mining and Mineral Processing Industry: An Analysis of Trends and Implications, U.S. General Accounting Office, Washington, D.C., 1979, p. 28.

250 million of those 295 million acres will be transferred to the State of Alaska, Alaska natives, and the national park, wildlife refuge, and forest systems if the Alaska Lands Legislation is passed in its current form. The Forest Service is the second largest Federal land manager, with about 188 million acres. Other Federal land-mangement agencies include the National Park Service (25 million acres), Fish and Wildlife Service (32 million), Department of Defense (over 30 million), the Corps of Engineers (8 million), Bureau of Reclamation (7 million), Department of Energy (2 million), and TVA (about 1 million).

At one time, most Federal lands were open for mineral exploration and development. The Wilderness Act of 1964 created about 9 million acres of Federally protected wilderness. Successive withdrawals under various authorities have been carried out until two-thirds of all Federal lands now have restrictions on mining activities. The following table provides an estimate of limitations and restrictions placed on Federal lands which prohibit or discourage mineral exploration and development. It should be noted that 42 percent of these lands have been closed to mineral activity, 16 percent severely restricted, and 10 percent moderately restricted.

Every major national commission study has called for a U.S. mineral policy which encourages mineral production from Federal lands. Critics of land withdrawals argue that this withdrawal policy is inconsistent with U.S. mineral policy, particularly for those nonfuel minerals for which the United States is heavily dependent upon insecure foreign sources.

The GAO recently contended that these restrictions on access have contributed to the decreasing trend in exploration, and constitute a deterrent to future discovery. GAO further contended that no comprehensive inventory of

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Classification of Federal Lands According to Limitations and Restrictions that Prohibit or Discourage Mineral Exploration and Development Under the Mining Law, 1974 Data

Degree of Availability	Category Number	Description	Acres (millions)	Percent of Total
Formally Prohibited	A1	National Parks and Monuments	14.6	2.0%
	A2	Naval Petroleum and Oil Shale Reserves	23.9	3.3
	A3	Military (other than Naval Reserves)	17.4	2.4
	A4	Indian Purpose Lands (Not Reservations)	4.2	.6
	A5	Wild and Scenic Rives (Wild Category Only)	.5	.1
	A6	Reclamation and National Recreation Areas	5.7	.8
	A7	Atomic Energy Commission	1.4	.2
	A8	Small Tracts and Recreation and Public Purposes	.5	.1
	A9	Administration and Recreation Areas (Forest Service and Bureau of Land Management)	1.9	.3
	A10	Utility Corridor (Alaska)	2.9	.4
	A11	Oil Shale	3.7	.5
	A12	Wildlife Refuges	18.6	2.5
	A13	Alaska Native Claims Settlement Act (ANCSA) Native Selections	120.0	16.3
	A14	ANCSA - D2 Four Systems	80.0	10.9
	A15	Bureau of Land Management Primitive and Natural Areas	.4	.1
	A16	Proposed Witndrawals	2.6	.4
	A17	Miscellaneous	6.5	.9
	A18	Classification and Multiple Use Act	.7	.1
		Subtotal	305.5	41.9
Severely Restricted	A19	Application for Alaskan State Selections	55.5	7.6
	A20	Wilderness Areas	10.7	1.5
	A21	ANCSA - D1 Lands (Open for Metalliferous Only)	46.0	6.3
	A22	Utility Corridor (Open for Metafffiferous Only)	2.5	.3
	A23	Proposed Wilderness (Primitive Areas-Forest Service)	3.8	.5
		Subtotal	118.5	16.2
Moderately Restricted	A24	National Trails	.1	-
	A25	National Parks and Monuments	5.1	.7
	A26	Power Site Withdrawals	15.2	2.1
	A27	Forest Service Roadless Areas (Wilderness Review)	55.9	7.6
		Subtotal	76.3	10.4
Slight or no Restrictions	A28	Leased Areas (Some Overlap)	73.8	10.0
	A29	Bureau of Land Management Wilderness Review Areas	24.7	3.4
	A30	Stock Driveways	2.5	.3
	A31	Tenatively Approved Alaskan State Selections	13.0	1.8
	A32	Other	119.6	16.3
		Subtotal	233.6	31.8
		Grand Total	733.9	100.0

Source: "Final Report of the Department of Interior Task Force on the Availability of Federally Owned Mineral Lands", Vol. 1, 1977, p. 48.

withdrawals exists, and the inadequate mineral information compiled about Federal lands is insufficient to determine U.S. mineral capabilities. They went on to conclude:

> We found that there is no single source of cumulative withdrawal statistics. No one Federal agency maintains records on all the withdrawals on public lands, and no cumulative records are maintained by any agency for the lands under its jurisdiction. And, since withdrawal actions can originate in a number of ways, there is no single public document from which withdrawal statistics can be derived. While BLM has the responsibility for disposing of minerals on most public lands, it does not maintain a comprehensive set of records showing what lands are available for mineral entry and what lands are not. Each land-managing Federal agency keeps its own records and, to some extent, sets its own requirements for mineral exploration and development within the lands under its jurisdiction. In some cases, these conditions vary with an individual ranger or district land manager. 7/

Industry critics go further, claiming that Federal land managers have chosen to administer public lands so as to inhibit and discourage mineral exploration and development even though, industry critics believe, the Forest Service and BLM Organic Acts confer the necessary authority to land managers to permit such activities. In addition, they point out that minerals can be extracted only from locations where the deposits exist, and exceptions should be considered for mining those minerals for which the United States is heavily dependent on insecure foreign sources.

The Federal Land policy and Management Act of 1976 provides policy guidance which addresses some of the problems noted above. The Act suggests that public lands should be inventoried, previous classifications reviewed, and Federal lands managed on the basis of multiple use and the Nation's need for minerals, food, timber, and fiber. Another concern expressed by GAO is the lack

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7/ Mining Law Reform and Balanced Resource Management, U.S. General Accounting Office, 1979, p. 16.

of adequate Federal Government exploration and development expenditures. Federal expenditures for exploration and development on Federal lands are estimated at only 11 percent to 15 percent of total expenditures for these purposes. Other nations, such as South Africa, Canada, Argentina, Korea, Philippines, Spain, and Brazil either actively participate in exploration for certain minerals, fund 33 to 80 percent of exploration costs, or provide development loans and loan guarantees to finance exploration and development.

A number of countries, such as France, Germany, Japan, and Korea, also provide various ingentives to their mineral industries for foreign mineral exploration and development.

C. Mining Law

1872 Mining Law - There have been various attempts to revise the General Mining Law of 1872 in recent years. Support for such a revision has come from various quarters including the General Accounting Office, environmental groups, and recently from the Carter Administration. The 1872 statute was enacted a century ago as an incentive to promote mineral exploration and development and to encourage settlement of the West.

The Act of May 10, 1872, (30 USC §22) provides that "...all valuable mineral deposits in lands belonging to the United States...shall be free and open to exploration and purchase ..." Mining is considered the highest and best use of the public lands, and the Act rewards minerals discovery. An exclusive mineral right to the land is obtained by filing a mining claim and paying a fee of $2.50 to $5.00 per acre to establish possession. Mining claims are limited to 20-acre tracts, but no restriction is placed on the number of tracts per individual or corporation. It is estimated that over 6 million mining claims have been filed during the last 100 years.

One criticism of the 1872 Statute is that mining claims are filed at county courthouses, and no Federal record of valid claims exists. In an attempt to remedy this concern, Section 314 of the BLM Organic Act (Federal Land Policy and Management Act of 1976) requires that all mining claims be recorded with BLM Local District Offices within three years of enactment to preserve existing claims.

Critics also claim that the 1872 Act has failed to promote exploration and development. They cite instance after instance where mining claims are filed for purposes other than mining, including land speculation, construction of vacation homes and cabins, cutting of timber, etc. They argue that the Act does not force claim holders to engage in mineral production. The General Accounting Office, in a 1974 Report calling for revision of the 1872 Law, reported that an investigation of 240 mining claims and 93 mineral patents produced evidence of only one claim and seven patents being mined. The Act is also criticized for its subsidization of the mining industry through the disposition of resources from Federal lands for which the Government and taxpayers have not been fairly reimbursed. Environmentalists also charge that the Act does not protect Federal lands from environmental damage.

The General Accounting Office has recommended that the 1872 Statute be replaced with a leasing system incorporating a permit system for exploration and development, a royalty for mineral production, and submission of an exploration plan detailing measures to be taken to minimize environmental damage. To promote production, rent payments would be made by lessees until production begins. The mineral industry opposes the leasing system as being unfair to smaller mining operations, which would be forced to compete with the major mining companies.

It should be noted that estimates have been formulated as to the potential Federal land contribution of various mineral commodities. The following table provides one estimate prepared by GAO, using data from the Department of Interior and the National Commission on Materials Policy 1973 report. While greater exploration and development efforts might increase domestic production, many areas containing these mineral deposits have been withdrawn from mining activity. 8/

In another report issued in 1979, GAO again concluded:

> Reform of the mining law appears necessary to reverse adverse trends in exploration and to assure future availability of domestic mineral supplies. Efforts to reform the law, however, are polarized between those wishing to repeal the existing law in its entirety and replace it with an all-leasing system, and those maintaining that retention of the incentive provisions of the 1872 law are critical to future supply stability. 9/

Mining and Minerals Policy Act of 1970 - Concern over increasing dependence from foreign sources for 20 mineral commodities prompted Congress to enact the Mining and Minerals Policy Act (P.L. 91-631). This brief statute is a congressional declaration of U.S. mineral policy, and states:

> The Congress declares that it is the continuing policy of the Federal Government in the national interest to foster and encourage private enterprise in (1) the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries; (2) the orderly and economic development of domestic mineral resources, reserves, and reclamation of metals and minerals to help assure satisfaction of industrial, security and environmental needs; (3) mining, mineral, and metallurgical research, including the use and recycling of scrap to promote the wise and efficient use of our natural and reclaimable mineral resources; and (4) the study and development of methods for the disposal, control and reclamation of mineral waste products, and the reclamation of mined land, so as

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8/ Mining Law Reform and Balanced Resource Management, U.S. General Accounting Office, 1979, p. ii.

9/ Ibid., p. 3.

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Reserves, Resources of Selected Mineral Commodities and Potential Federal Land Contribution

Mineral Commodities	Reserves 1/ at Current Prices	Hypothetical Resources 3/	Potential 2/ Federal vs. Non-federal	Imports Exceed 50% of 1976 Domestic Consumption *
Aluminum, Million ST	10	Very large	Major	*
Antimony, Thousand, ST	120	Small	Major	
Berylium, Thousand ST	28	Huge	Major	
Bismuth, Million lb	26	NA	Major	*
Cadmium, Million lb	220	NA	Major	*
Chromium, Million ST	NA	Insignificant	Major	*
Coal, Billion ST	437 (a)	Huge	Medium	
Cobalt, Million lb	540	NA	Major	*
Copper, Million ST	93	Large	Major	
Fluroine, Million ST	16	Small	Major	*
Gold, Million Troy oz.	100	NA	Major	*
Graphite, Million ST	NA	Very large	Minor	
Gypsum, Million ST	350	Huge	Major	
Iron, Billion ST	4	Huge	Medium	
Lead, Million ST	59	Moderate	Major	
Manganese, Million ST	NA	NA	Major	*
Mercury, Thousand Flasks	430	NA	Major	*
Molybdenum, Million lb	7	Huge	Major	
Natural Gas, tr. cu. ft.	228	Large	Medium (Onshore)	
Nickel, Million lb	400	Moderate	Major	*
Petroleum, Million bbl	33	Large	Medium (Onshore)	
Phosphate Rock, Million ST	2,500	Very large	Major	
Potash, (K2Oeq..) Million ST	200	Huge	Medium	
Soda Ash, Billion ST	30	Huge	Major	
Silver, Million Troy oz.	1,500	Moderate	Major	
Titanium, Million ST	32	Very large	Medium	*
Tungsten, Million lb	240	Moderate	Major	*
Uranium, (U308) Thousand ST	640 (b)	Large	Major	
Vanadium, Thousand ST	115	NA	Major	
Zinc, Million ST	30	Very large	Medium	

1/ USBM Estimate 1973.

2/ Hypothetical Resources. They are undiscovered but geologically predictable deposits of materials which are essentially well known as to location, extent and grade and which may be exploitable in the future under more favorable economic conditions or with improvements in technology.

3/ Resource appraisal terms: Huge--domestic resources are greater than 10 times the minimum anticipated cumulative demand (MACD) between 1971 and 2000; Very large--domestic esources are 2 to 10 times the MACD; Large--domestic resources are approximately 75% to twice the MACD; Moderate--domestic resources are approximately 35% to 75% of the MACD; Small--domestic resources are approximately 10% to 35% of the MACD.

a) Reserve base (b) At $30 per lb.

Source: Modifications of Data in Final Report of the National Commission on Materials Policy, June 1973, for Department of Interior Task Force Report on Minerals Availability.

> to lessen any adverse impact of mineral extraction and processing upon the physical environment that may result from mining or mineral activities.

However, this legislation provided no new authorities to the Secretary of Interior, or other Federal agencies who were charged with the responsibility for carrying out these provisions. In addition, no funds were authorized or appropriated for this purpose.

Critics argue that the Department of Interior, as the lead agency for mineral matters, has failed to implement the 1970 Statute, and has ignored its provisions when weighing its own mineral-policy decisions, and has failed to forcefully defend the mining and mineral industries' legitimate interests. The Department of Interior has responded by arguing that most environmental and health and safety legislation was enacted after the 1970 Statute, and the Congress has provided specific direction in these legislative enactments as opposed to the very general policy guidance contained in the Mining and Minerals Policy Act. This, they argue, leaves the Department with conflicting guidance. The National Commisison on Materials Policy recommended in 1973 that Congress require any new legislation to adhere to the congressional policy contained in the Mining and Mineral Policy Act, and for the President to require agencies to administer their programs in conformance with the Act in a manner similar to their adherence to the National Environmental Policy Act of 1969.

In recent oversight hearings held by the Mines and Mining Subcommittee of the House Interior Committee on the President's Nonfuel Mineral Policy Study dispute, the Department of Interior claimed that they promote environmental and conservation goals above those mineral policy goals embodied in the 1970 Act. The oversight hearings charged that the nonfuel study was a whitewash and intellectually dishonest, since the study excluded discussion and analysis of the

Alaska lands legislation, deep seabed mining, stockpile policy, and revision of the 1872 Mining Law.

D. Taxation

The corporate tax rate applicable to mining and mineral industries is reduced by the standard business deductions, such as salaries, operating expenses, research costs, rent, depreciation, investment losses, etc. In addition, the mineral extraction industries have been allowed depletion deductions. These deductions are taken as either "cost" or "percentage" depletion.

The cost depletion is computed by dividing the number of mineral units (reserves) into the cost of acquiring the property, plus any exploration costs. This provides cost depletion per unit of reserve (e.g. dollars per ton). This figure is then multiplied by the mineral units mined in the taxable year, to arrive at the cost depletion for that year. Obviously, the cost depletion per unit of reserve is reduced if the reserves are estimated upward at a later date. Consequently, critics argue that reserves are often underestimated to provide large cost depletion deductions in early years.

The percentage depletion is a fixed statutory percentage which is applied to the gross income for the property, and ranges from 5 percent for gravel and sand to 22 percent for such minerals as sulfur, uranium, cobalt, manganese, nickel, platinum, tin, titanium, and zinc. However, the deduction is limited to 50 percent of the taxpayer's taxable income from the property.

Previous national commissions have considered the issue of depletion allowances and have favored their retention as an incentive for mineral exploration, development, and production. However, in 1976 the National Commission on Supplies and Shortages recommended their repeal, citing loss of an estimated

$850 million in FY1977 to the U.S. Treasury and the marginal-price effect of this tax subsidy.

The mining industry argues that it would be disastrous to remove the depletion allowance, since the resulting cash flow has provided an important source of capital funds for the industry. They further argue that since mining is one of the most capital-intensive industries and their debt now averages 34 percent of capital and rising, generating the necessary funds for new projects would become even more difficult.

The mining industry also notes that most new copper mines were developed during the 1950's with Government assistance which is no longer available, such as stockpile purchases, emergency write offs, and subsidized loans.

The Tax Committee of the American Mining Congress makes the following suggestions concerning the tax treatment of their industry. They favor flexible capital-recovery allowances for plant and equipment costs, continuance of percentage-depletion allowances, continuation of the 10% investment-tax credit, use of the energy-investment credit to improve the energy efficiency of mining and mineral processing, repeal of the minimum taxation on corporations, and repeal of the double taxation to shareholders. Other suggestions include amendment of laws and regulations to allow the issue of tax-exempt bonds to provide inexpensive pollution-control financing, and allowing the total cost of minerals exploration as a tax-deductible item (proposed by the National Commission on Materials Policy).

The mining industry has pointed out that other foreign countries provide more favorable tax treatment to their mining companies than the United States, placing the United States at a competitive disadvantage. The GAO addressed this point in a 1979 report:

The structure and stability of a nation's tax system affects the relationship between the costs and revenues of mineral projects and, thereby, the investment decision. In addition to generating revenue, tax structures have historically been used to stimulate industry. Although no comprehensive comparisons of the effect of various countries' tax systems on the mineral industry have been made recently, analyses made in 1970 and 1975 show that the U.S. tax structure does not provide as good an investment climate as that of most other countries.

A presidential task force on business taxation reported in 1970 that U.S. tax laws cause American industry to recover capital outlays much slower than do industries in most foreign countries.10/

E. Antitrust Policy

The major U.S. Antitrust Statutes include the Sherman Act (1890), the Clayton Act (1914), and the Federal Trade Commission Act (1914). These statutes were enacted to promote competition by preventing monopolies, unfair combinations in restraint of trade, and unfair business practices.

It has been suggested that U.S. antitrust laws may be hampering U.S. mining and metals industries from joining together to share costs and risks, preventing useful mergers, and limiting cooperative efforts between industry and Government officials for the purpose of solving mineral problems. Two recent studies seem to support this view. The GAO in a 1979 study reported the results of interviews with U.S. mining officials on this subject. These officials told GAO that U.S. antitrust policies discourage domestic firms from undertaking joint ventures with each other and with foreign firms. Reasons cited by these officials included the belief that U.S. antitrust laws are not specific and therefore subject to unfavorable Federal interpretation of their joint-venture arrangements, the applicability of these laws to foreign competition is unclear, and U.S. law is based on definitions of monopoly and competition designed for

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10/ The U.S. Mining and Mineral Processing Industry: An Analysis of Trends and Implications, U.S. General Accounting Office, 1979, p. 45 and 46.

an essentially closed domestic market and does not reflect the role and impact of foreign competition. However, Justice Department officials interviewed by GAO rebutted this view, arguing that fear of Government antitrust investigations is unfounded and not supported by Justice Department policy. On the other hand, State Department officials confirm industry officials' concern about such antitrust investigations, citing their refusal to participate in various international discussions for fear of possible antitrust violations.

Industry officials believe that U.S. antitrust laws should be updated to recognize the role of foreign competition as reflected in the increasing dependence by the United States on foreign imports. Contrasting foreign antitrust policy with U.S. policy GAO concluded:

> In contrast, antitrust legislation enacted by a number of other countries after World War II recognizes that their economies, for the most part, are no longer closed. In these countries, maintaining competiton between domestic firms has become less important than maintaining competition between domestic and foreign industries. As a result, antitrust exemptions in these countries are more liberal than those of the United States. For example, Japan and the European Economic Community permit domestic companies to combine into commodity group cartels in order to improve production and marketing efficiencies and to encourage small, relatively inefficient firms to combine into one large-scale operation. Most of the major metallurgical plants built in Japan and Western Europe in recent years were built as joint ventures under this concept. 11/

The preliminary draft report of the Nonfuel Mineral Policy Study (Feb. 9, 1979) is less conclusive on the impact of U.S. antitrust policies on domestic mining-industry competitiveness, but agreed with GAO that U.S. antitrust policies are restrictive:

> The United States has more restrictive antitrust policies than the rest of the world. This, it is claimed by some, reduces the competitiveness of U.S. mineral industries by limiting the ability of producers to cooperate with each other in research and in other areas,

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11/ Ibid, p. 35.

and by preventing mergers between firms of suboptimal size. In practice, however, it is difficult to determine whether this variable has seriously affected the competitiveness of U.S. mineral industries especially since antitrust policies are designated to promote more vigorous and aggressive domestic firms. As a result, the effect of antitrust policies is indeterminant for most mineral industries.

F. National Defense Stockpiling

The advisability of stockpiling materials to avoid possible shortages during wartime was first perceived in the early 1920s, following World War I, and the need for such materials was further reinforced by subsequent conflicts. Although the Navy was authorized in 1937 to create a Strategic Materials Reserve, no comprehensive national stockpiling activity took place until after World War II when the National Stockpile was created. 12/ Subsequently, two additonal stockpiles were created: the Supplemental Stockpile and the Defense Production Act Inventory. 13/ The three stockpiles were merged in 1979 into a single National Defense Stockpile, 14/ consisting of various quantities of 93 materials worth an estimated $13.0 billion (as of September 30, 1979).

Stockpiling of materials was initially conceived as a measure to reduce or even eliminate what was termed (in the Stockpiling Acts) as a "dangerous and costly dependence" upon imports of vital materials in times of national wartime emergency. Although the materials requirements of World War I had been met with relatively little difficulty, World War II generated unprecedented requirements

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12/ The National Stockpile was created by the Strategic and Critical Stockpiling Acts of 1939 and 1946 (P.L. 117, enacted June 7, 1939 and P.L. 520, enacted July 23, 1946, respectively).

13/ The Supplemental Stockpile was created by the Commodity Credit Corporation Chapter Act of 1949 and the Agricultural Trade Development and Assistance Act of 1954. The Defense Production Act Inventory was created by the Defense Production Act of 1950.

14/ The National Defense Stockpile was created by the Strategic and Critical Materials Stock Piling Revision Act of 1979 (P.L. 96-41, enacted July 30, 1979).

for vast quantities of materials for use in tanks, aircraft, cannons, ships, wheeled vehicles, communications, rockets, ammunition and various personnel equipment. Stockpiling was viewed as a major element in providing the materials needed for these uses to industry in the minimum possible time, and of preventing the possible interruption of needed supplies.

At present, little controversy exists concerning the need for a national materials stockpile; rather, the current issues of major concern relate to what materials should be included in the stockpile, how they should be used, and where they should be stored, as discussed below.

(1) Choice of materials. The Stockpile Revision Act of 1979 identifies candidates for stockpiling as those materials that "(A) would be needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency, and (B) are not found or produced in the United States in sufficient quantitites to meet such need." Determination as to what specific materials meet these criteria are now made by the Federal Emergency Management Agency (FEMA), which has executive authority for determining and administering stockpile policy. A review of current stockpile needs was recently completed by FEMA, and a new list of those materials to be included in the stockpile was announced on May 2, 1980. 15/

(2) Quantity of materials. The quantity needed of each material included in the stockpile depends largely upon the degree of protection desired against potential supply interruption. Original requirements were for sufficient quantities of materials for a "total war" lasting 5 years; later the period was reduced to 3, then to 1, then back to 3 years, where it now stands. In general,

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15/ See Appendix D.

past administrations have tended to opt for smaller quantities than has the Congress. Results of the FEMA review, announced on May 2, 1980, included newly-established or reaffirmed quantity goals for all stockpiled materials.

(3) Economic considerations. The revised Stockpile Act specifically reaffirmed that the stockpile is intended solely for national defense purposes and is not to be used as a means for controlling or influencing commodity prices. Nonetheless, the issue continues to be raised as to whether it might be advisable to use the stockpile for the latter purpose as well. Proponents claim that materials could be bought for the stockpile in times of surplus and sold during times of shortage, thus balancing supply and demand and thereby helping to stabilize prices and dampen the wide fluctuations in price that frequently occur, especially with the primary metals. Such use, it is claimed, would result in more rapid turnover of stockpiled materials and would assure a constant influx of fresh materials. Opponents claim that use of the stockpile for economic purposes would represent an unwarranted intrusion by the Government into the free-enterprise marketplace, and could render the stockpile a "dumping ground" for excess producer capacity. They also maintain that, should a defense-related emergency occur immediately following a period of materials shortage, sales from the stockpile for economic purposes might have depleted it to such an extent that it could no longer serve its primary defense purpose.

(4) Private stockpiles. Suggestions have been made that the requirements placed upon the national stockpile could be considerably reduced by suitable Federal incentives to encourage users to maintain larger-than-normal inventories of currently stockpiled materials. Since the bulk of all federally-stockpiled materials ultimately would be consumed by these same primary users during an emergency, it is argued that private stockpiling would reduce the

time needed to ship stockpiled materials to users in an emergency would more closely tailor the type and quality of raw material to a particular user's requirements, and would assure that stockpiled materials were constantly turned over and kept fresh and up to date. Opponents maintain that any such program would make central control difficult, would be open to abuse by individual users, would add to administrative complexity, and might be very costly.

G. Conservation, Substitution, and Recycling

Although the total amount of various minerals that exist in the earth's crust is vast, ores (natural concentrations) from which these minerals may economically be extracted are becoming increasingly scarce and more expensive to locate. As higher-grade ores become exhausted, the shift to lower-grade ores requires the processing of much larger quantities of ore to extract the same quantities of minerals, requires the use of more energy to do so, and involves the disposal of more wastes. This phenomenon, sometimes called "the tyranny of low-grade ore," might ultimately lead to a state in which society could no longer afford the cost--in labor, capital, energy, and potential environmental damage--of extracting minerals from very low-grade resources. 16/ The end result of this "tyranny"--shortages of basic minerals and materials--could be ameliorated or postponed in a number of ways, as discussed below.

(1) Conservation. The key to making resources last longer is to use less, an objective that can be accomplished in several ways. First, and in theory the most simple, is to make do with less. In a markedly consumption-oriented society, however, this may be much easier said than done. Second, conservation can be designed into products by using the least amount of material necessary to

16/ See: Herbert H. Kellogg. Toward a materials conservation ethic. Metallurgical transactions A, vol. 9A, No. 12: December 1978, p. 263.

provide reasonable safeguards against premature breakdown or failure. Third, by careful choice of the most appropriate materials to achieve a given function, or ideally by developing materials specifically tailored to a given use, less material may be required than would otherwise be the case. Fourth, by utilizing materials and design techniques so as to achieve maximum durability and long life, materials can be conserved. And fifth, materials can be conserved by development and use of techniques for forming, joining, and finishing that result in the minimum possible non-recoverable waste.

(2) Substitution. A second means for achieving conservation of materials lies in the substitution of one material for another. As noted in a recent report of the Office of Technology Assessment, the three fundamental classes of substitution involve materials, processes, and functions; most substitutions represent a complex process of decisions involving all three.17/ The report emphasizes that substitution does not consist merely of replacing one material with another, but also may involve the replacement of one process with another, or the replacement of one function--or level of function--for another, or some complex combination of all three.18/ Conceivably, each change in materials, process, or function could result in significant conservation of materials, energy, or both.

Typically, good conservation practice increases the substitution of materials that are relatively abundant for those that are relatively scarce. Exceptions arise, however, because materials use is subject to the constraints of

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17/ Office of Technology Assessment. Materials information systems, volume IV: materials substitutability and information systems implications. February 1976, pp. xi, 1.

18/ Ibid, pp. 2,4.

total life-cycle costs--extraction, processing, engineering, waste disposal, and maintainability--which are not necessarily inversely proportional to abundance. In such cases, conservation may be better served by use of a scarce material rather than an abundant one.

Another conservation approach is to substitute renewable resources for those that are becoming scarce, for example, in using wood instead of metals and plastics, or natural fibers instead of synthetic fibers derived from petroleum or natural gas. In general, except for such high-tonnage materials as iron and steel, the limiting factor governing such substitutions is not so much the availability of substitute materials as it is time. The sheer complexity of designing around specialized uses involving complex, highly-sophisticated hardware and systems, requires a long lead time that is difficult to reduce. However, suggestions have been made that one approach to reducing the lead time is to perform as much of the R&D in advance as can reasonably be done, thereby maintaining a stockpile of substitution "technology-on-the-shelf" that could be used in an emergency.

(3) Recycling. Traditionally, primary emphasis has been placed upon the aggressive promotion and satisfaction of markets through the production, use, and disposal of virgin materials resources. This approach was encouraged by the vast, seemingly inexhaustible materials resources available domestically, as well as by the need to make these resources available for a rapidly growing population and expanding economy. Recovery of materials for reuse was unattractive because such materials were typically more expensive and less desirable than virgin materials. As a result, the Nation developed an economy based largely upon consumption and disposal--the so-called "throw-away" life style--rather than upon materials conservation, recycling, and reuse.

This situation has now begun to change. The Nation's richest, primary deposits of some industrial raw materials have now been exhausted, thus creating greater dependence upon materials imported from abroad, or, alternatively, creating the need to mine lower-grade domestic deposits at potentially greater costs. Furthermore, the Nation has experienced periodic shortages of many materials at the same time that municipalities from coast to coast were struggling to dispose of vast quantities of solid waste containing a substantial proportion of many of these same sought-after materials. It has been urged that a strong need exists to couple the "disposal output" to the "feedstock input" of the materials pipeline, thereby establishing insofar as possible closed materials cycle that would help meet raw materials needs, while simultaneously helping to solve critical problems resulting from the increased generation of mineral, agricultural, municipal, and industrial wastes that may amount to as much as 3-4 billion tons/year. Of major concern is municipal post-consumer solid waste, generated at a rate of about 154 million tons per year 19/, at a disposal cost of approximately $4 billion per year. The future generation of such waste may approach 175 tons/year by 1980, 201 million tons/year by 1985, and 225 million tons/year by 1990. 20/ Waste management costs to both the public and private sectors during the decade ending in 1986 may exceed $94 billion. 21/

At present, nearly all major materials are recycled and reused, at least to some extent. Percentage recovery rates for some materials (not including

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19/ Council on Envrionmental Quality. Tenth annual report. Washington, D.C., U.S. Government Printing Office, December 1979, p. 256.

20/ Estimate by the U.S. Environmental Protection Agency.

21/ Solid Waste Report, January 29, 1979, p. 21.

home scrap) were as follows for 1977 and, in parentheses, as estimated for 1985: ferrous metals, 2.4 (5.5); aluminum, 10.0 (16.4); paper, 20.6 (24.6); glass, 3.4 (5.9); and rubber, 4.1 (4.4). It has been estimated, however, that recycling could provide about 40 percent of the metals, glass, plastics, fibers, and rubber needed each year by the Nation's manufacturing industries. In 1977 only about 8 percent of these materials, and others that could be recovered from municipal waste, actually were recovered and reused. The overall recovery rate is not expected to exceed about 13 percent by 1985. 22/

Many municipalities, as well as some State governments, are now moving toward at least some recycling, but progress has been slow. Adequate technology for the separation of mixed municipal solid waste into such various components as metal, glass, plastic, and paper now exists, but assured and stable markets for the materials thus reclaimed are generally lacking. Without such markets, and the assurance of adequate future supplies of reclaimed materials at reasonably stable prices, industry has been loath to commit sizeable investment capital to facilities that would use such materials as primary feedstocks.

Among those initiatives most frequently suggested to improve the current rate of resource recovery and recycling are the following:

(a) promote markets for recycled materials;

(b) encourage further research and development to help solve remaining problems concerning the recovery of such materials from solid waste;

(c) encourage use by the Federal Government of products made from recycled materials;

(d) make use of the Federal Government's purchasing power to stimulate markets for recycled materials;

22/ CEQ, tenth report, p. 262.

(e) provide Federal funds for the development and construction of facilities to recover waste materials for further recycling and reuse or to convert them to energy; and

(f) stimulate the creative reuse of waste materials.

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The above approaches to minerals and materials conservation are largely directed toward reducing demand. Other approaches involve increasing the supply of minerals and materials, as for example the following:

(a) increased exploration efforts determine more accurately the Nation's domestic resource posture;

(b) more intensive development of known mineral resources on Federal lands;

(c) development of more efficient techniques and technology for the extraction and processing of lower-grade ores, thereby converting known resources into reserves;

(d) development of constructive uses for mine tailings and other extractive wastes so as to reduce the costly burden incurred by the need for treatment of such wastes in an environmentally sound manner; and

(e) increased R&D to develop improved processing and fabricating methods that enable production of finished forms or products directly from raw materials with a minimum of waste.

H. Federal Government Organization

The underlying role of minerals and materials in the U.S. economy is so broad and diverse that it should come as no surprise to find that this same broad diversity is similarly reflected in Federal policy-making for

minerals and materials. As found by the recent Carter Administration review of nonfuel minerals policy, the decisions, policies, and programs of more than 20 different Federal departments, agencies, councils, and commissions--operating under more than 80 different laws, executive orders, and regulations--significantly affect nonfuel mineral supply and consumption. 23/ As pointed out by numerous boards, commissions, and study groups that have systematically examined this situation for almost 30 years, the activities of these various Federal decision-making groups are, for the most part, essentially ad-hoc, unstructured, and uncoordinated. Three basic questions regarding these activities can therefore be raised: (1) is it possible to structure and coordinate so immense, complex, and wide-ranging an enterprise as Federal policy for nonfuel minerals and materials; (2) if possible, would it be advisable; and (3) if advisable, how might it best be accomplished? 24/

(1) Is it possible? Materials are woven into the fabric of virtually all aspects of the society. As noted earlier, considerable legislation has already been enacted in such areas as environmental health and safety, Federal land management, mining, taxation, and antitrust--all of which impact heavily upon minerals, their cost and availability. Thus, it is often argued that any attempt to centralize federal policymaking for minerals and materials will inevitably fail because the task is simply too immense to be manageable. It is

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23/ U.S. Department of Interior. Background papers: draft for public review and comment of the report on nonfuel minerals policy review. August, 1979, p. VI-10.

24/ See also discussions in the following committee prints issued by the House Committee on Science and Technology: Materials policy handbook, June 1977, pp. 7-45; Summary of hearings. A national policy for materials: research and resources, September 1978, pp. 7-8; and A national policy for materials: research and resources. Interim report, December 1978, pp. 19-23.

argued that the task involves so many different issues, each of which has so many possible ramifications, that one could not possibly consolidate the necessary apparatus under one roof.

Proponents of centralization of policy contend that opponents cannot see the forest for the trees: it is entirely possible, they claim, to have an overall policy without microscopically examining each detail of every issue. The two key factors, they maintain, are size and location. With regard to size, they recommend a group of analysts small enough to remain manageable, but broad enough to focus upon key policy issues, including those which impact upon related issues of energy policy and environmental policy. With regard to location, they stress the need for such a group to be lodged at a sufficiently high level within the Federal Government to command both respect and response from those departments and agencies charged with carrying out such policies. Attention to these two key factors, they contend, makes centralized Federal policymaking for minerals and materials entirely feasible.

(2) Is it advisable? Opponents of a centralized approach maintain that the Nation's pluralistic, free enterprise society requires a multiplicity of inputs to the decision-making process that may lead to a multiplicity of solutions, inasmuch as no "one best" solution may exist. Any attempt to centralize decision-making, they contend, could threaten imposition of a power center of doubtful political acceptability and with a rigid, inflexible approach to problems that necessarily require flexibility in dealing not only with impacts on the Federal level but also on the State, municipal and local levels. Further, they stress, the present incremental, remedial system of materials policy decision has functioned remarkably well over the years despite all the criticisms

of it. And finally, they ask, if a centralized policy really is needed as desperately as advocates claim, why has no such policy evolved despite almost 3 decades of blue-ribbon commissions calling for it?

Proponents claim that the time has long since passed when the Nation can afford--if indeed it ever could--the luxury of dealing with problems as they arise, without anticipating them, and groping for solutions in an atmosphere of crisis. They maintain that the increasing severity and complexity of the kinds of problems the Nation now faces--declining high-grade domestic resources, increasing dependence upon imports from abroad, need to reduce waste and increase resource recovery and recycling, necessity of substituting resources that are plentiful for those that are becoming scarce, need to shift from nonrenewable to renewable resources, growing threat of potential energy and materials import boycotts for political reasons, and the political instability of many of those nations the United States is most dependent upon--these and other problems all mitigate against continuing with the present ad-hoc, unstructured approach. Additionally, proponents claim, the need for providing adequate quantities of materials essential to the development of future U.S. energy supplies, as well as the need for meeting the Nation's future materials requirements without adversely affecting environmental quality, make a centralized approach mandatory. Finally, proponents maintain, the role of materials within the economy and for purposes of defense is so ubiquitous that the continued lack of centralized policymaking may undermine the Nation's capability for economic growth and threaten its national security.

(3) If advisable, how accomplishable? Understandably, those who maintain that no centralized focus for minerals and materials policymaking is necessary offer few suggestions as to how such centralization might best be accomplished.

The Carter Administration has consistently maintained that, since "the Office of Science and Tecnnology Policy legislative authority provides a sound basis to undertake all of the work of analysis and interagency coordination necessary to deal with materials issues," no further organizational arrangement is necessary. 25/ Nonetheless, in response to continued congressional prodding, the Administration recently reconstituted, at the Assistant Secretary level, the Committee on Materials (COMAT) within the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET).

Despite the above views, most major studies of the minerals and materials issues from the President's Materials Policy Commission (Paley Commission) in 1952 to the National Commission on Supplies and Shortages (NCSS) in 1976 have consistently recommended some form of centralized policymaking structure for minerals and materials. The Paley Commission, for example, stated,"There must be, somewhere, a mecnanism for looking at the problem as a whole, for keeping track of changing stations and the interrelations of policies and programs. This task must be performed by a Federal agency near the top of the administrative structure." 26/ Similarly, tne NCSS called for "some formal organization," specifically designed by each President to suit his own particular needs, served by a "nigh-quality professional staff" of about 20-30, plus appropriate support, located within the Executive Office of the President. 27/

25/ Summary of hearings, p. 8.

26/ President's Materials Policy Commission. Resources for freedom, summary of volume 1. Washington, D.C., U.S. Government Printing Office, June 1952, p. 76.

27/ National Commission on Supplies and Shortages. Government and the Nation's resources. Washington, D.C., U.S. Government Printing Office, December 1976, pp. 111-112, 117-118.

Legislative proposals, beginning with H.R.14439/S.3637 introduced in 1976, have consistently sought to place centralized policymaking for materials within the Executive Office of the President, either with a Special Assistant to the President for Materials Policy or with the Director of the Office of Science and Technology Policy. The bill currently before the Congress, the Materials Policy, Research, and Development Act of 1979 (H.R.2743), would leave organizational details to the President, who would be required to submit to the Congress an implementation plan--including both organizational and programmatic features--no later than one year following enactment of the bill.

Various legislative options for dealing with materials policy, ranging from "no change" to "comprehensive legislation," have been discussed previously 28/ and are given in Appendix C.

I. Minerals and Materials Research and Development

The current funding level for minerals and materials research and development is not known precisely and probably is impossible to determine accurately. The Administration, as part of its Domestic Policy Review of Nonfuel Minerals, found that over the period 1976-1977 total annual funding amounted to an estimated $3.4 billion, of which slightly more than half was funded by industry. 29/ However, it was pointed out that the categories included in this estimate were not ideally defined, that the data were both incomplete and out-of-date, and that some valid R&D activities were not

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28/ Interim report, pp. 49-62.

29/ Department of the Interior. Background papers: draft for public review and comment on the report on nonfuel minerals policy review. August 1979, p. 23.

ncluded in the estimate. Nonetheless, as of August 1979 this figure was considered "the best available aggregation of relevant data". 30/

A study by the Committee on Materials (COMAT), of the Federal Council on Science and Technology (FCST), determined that for fiscal year 1976, 18 Federal departments and agencies supported a total of more than $961 million in materials R&D. 31/ The definition of what kinds of activities were to be included in this estimate was broad, namely, "all aspects of R&D commitments to any of the stages in the life cycle of materials, ranging from the identification of natural resources to the final stage of recycle or disposal." 33/ A subsequent COMAT study of industry funding of similarly-defined R&D gave an annual value of about $4.3 billion (1977-78 time-frame) 31/, for a combined industry/Federal level of almost $5.3 billion, or an 82/18 percent industry/Federal split.

In view of the above, and regardless of what the correct figures may be, it is clear that a sizeable annual investment in minerals and materials R&D is being maintained by both industry and the Federal Government. Among the questions most frequently raised regarding this effort are: (1) is it enough; (2) are the industry/Government shares properly proportioned; (3) are the funds properly apportioned according to need; and (4) is the work adequately coordinated so as to avoid unnecessary duplication and waste?

30/ Ibid, pp. V-21,22.

31/ Committee on Materials. Phase I report: inventory and analysis of materials life cycle research and development in the Federal Government. April 1976 p. 8.

32/ Ibid, p. 4.

(1) Is it enough? It has always been fashionable in scientific circles to maintain that all soundly organized and conceived technical projects and programs that seek to advance the frontiers of science are equally valid and, hence, their claims for funding are also equally valid. This philosophy not only assures the maximum amount of research, but also eliminates the need for making the often unpleasant value judgments as to what can be funded and what cannot. Increasingly, however, as research has become more expensive and competing demands for funds greater, hard choices must be made. Industry has increasingly emphasized near- or mid-term efforts with primary concern for the payoff potential of R&D. Government has constantly had to choose among competing demands for Federal dollars, recognizing that R&D remains a concern of relatively low public visibility in comparison with other demands.

Thus, funding for R&D will probably never be enough in the sense that some worthwhile projects will always remain unfunded despite their obvious merit; that is, saturation of R&D effort is unlikely ever to occur. On the other hand, current funding may be enough in the sense that the sums involved are by no means small and may, indeed, be about all that the Nation can now afford. Further, they do appear to permit a level of ongoing effort sufficient to advance the science and technology of mineral and materials development, processing, and use on a broad and diverse front. 33/

(2) Industry/Government shares. Little of value may accrue from debate over the relative industry/Government shares of the materials R & D pie, though the subject is much considered. More to the point is the observation that, since industry funds about 80 percent of the effort, and since

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33/ Committee on Materials. Phase II report: inventory and analysis of materials life cycle research and development in U.S. industry. April 1979, p. 28.

industrial R&D clearly concentrates heavily upon relatively short-term issues, it is possible that long-term R&D lacks adequate funding support. Hence, it is argued, the role of the Federal Government increasingly should be to explore those research areas deemed unprofitable by industry or of high risk, but which contain a significant element of public well-being, health, or safety. It is often stressed that particular emphasis for Federal R&D should be given to more fundamental, long-term materials research and, specifically, to such areas as exploration, mining, beneficiation, extraction, and refining. 34/ Unfortunately, little data and analytical framework exists concerning the "optimum mix" of R&D.

(3) Apportionment by category. Typically, Federal R&D dollars tend to flow in the direction of greatest perceived unmet social need, and industrial R&D dollars in the direction of most likely economic potential. These observations are supported by the results of the Phase II COMAT study which showed that, on a percentage basis, Federal R&D dollars largely support basic science and technology, national security, and environmental protection whereas industrial R&D is concentrated in such areas as maintaining and improving the business economy, promoting improved communication, assuring adequate supplies of materials for manufacturing and consumption, promoting improved transportation, and maintaining and improving standards of living. 35/

(4) Coordination. It would appear inevitable that a certain level of duplication will always occur in industrial R&D because of the need for company secrecy and the threat of antitrust action should joint efforts be deemed collusion rather than cooperation. However, it is often pointed out that not all

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34/ Summary of hearings, p. 13.

35/ COMAT Phase II report, p. s-2.

overlap and duplication of effort is necessarily undesirable, especially where alternative approaches to a particular problem may be warranted or where the most advantageous approach remains unclear.

Federal R&D, which generally concerns neither secrecy nor fear of antitrust, may thus be held more accountable for unwarranted overlap and duplication, and indeed it is in this area that much criticism has been voiced. Recent studies by the General Accounting Office have called, first, for modernizing institutions and management of Federal materials R&D 36/; and, second, for major improvement in the way in which it is managed. 37/

Among the various options most frequently suggested for improving both industrial and Federal materials R&D are the following:

(a) allow increased pooling of industrial R&D without fear of Federal antitrust action where such pooling appears advisable in the public interest;

(b) coordinate Federal R&D more closely with similar projects and programs being undertaken in industrial and university laboratories;

(c) provide increased coordination of R&D among the various Federal departments and agencies that conduct or support it; and

(d) promote increased Federal support of mineral and materials science and engineering education to assure an adequate future supply of professional mineral and materials scientists and engineers.

36/ General Accounting Office. Federal materials research and development: modernizing institutions and management. December 2, 1975, 68 pages.

37/ General Accounting Office. Management of federal materials research should be improved. July 14, 1978, 51 pages.

9. COMPETITIVENESS OF THE DOMESTIC MINING INDUSTRY

The Nonfuel Mineral Policy Review (NMPR), the GAO, and mining industry officials have all expressed serious concerns about the competitiveness of various segments of the U.S. mining and mineral processing industry.

The NMPR reviewed 12 commodities including aluminum, asbestos, chromium, cobalt, copper, iron ore, lead, manganese, nickel, phosphate rock, silver, and zinc, and a 1979 GAO report concentrated on aluminum, copper, ferroalloys, and zinc.

Both studies concluded that a number of U.S. mineral industries have suffered or will suffer a severe decline in competitiveness. The following tables from the unpublished NMPR draft report of February 1979 depict declines in production or market share, and secular changes in the competitiveness of selected U.S. mineral industries for these periods — 1953-1957, 1973-1977, and a projection for the year 2000.

The general trend is toward increased reliance on imports, and GAO has noted that imports are increasing in the form of processed minerals (metals), with the probability of increasing U.S. reliance on mineral imports in the future. In addition, most replacement and expansion of mineral processing capacity for aluminum, copper, ferralloys, and zinc are planned for locations outside the United States. 36/

For example, during the past ten years, U.S. production of zinc metal has declined by 50 percent as ten U.S. zinc smelters have closed, foreign zinc-metal production has increased by 25 percent as new smelters have been constructed in Europe and Japan, foreign production of zinc ore has increased by 18 percent

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36/ The U.S. Mining and Mineral Processing Industry. An Analysis of Needs and Implications. U.S. General Accounting Office. 1979. p. 15.

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Segments of the U.S. Mining and Mineral Processing Industry That Have Experienced Declines in Production or Market Share

Mineral Industry	Decline in Physical Production		Decline in U.S. Producers' Share of Domestic Market		Decline in U.S. Producers' Share of World Market	
	1953/57 to 1973/77	1973/77 to 2000	1953/57 to 1973/77	1973/77 to 2000	1953/57 to 1973/77	1973/77 to 2000
Bauxite Mining	-	X	X	X	X	X
Alumina Refining	-	-	X	X	X	X
Aluminum Smelting	-	-	X	X	X	X
Asbestos Mining	-	-	-	-	X	-
Chromium Mining	X	-	X	-	X	-
Ferrochromium Smelting	-	X	X	X	n/a	n/a
Cobalt Mining	X	-	X	-	X	-
Copper Mining	-	-	-	X	X	X
Copper Refining	-	-	X	-	X	X
Iron Mining	X	-	X	-	X	X
Lead Mining	-	-	-	X	X	X
Lead Smelting	-	X	-	X	X	X
Manganese Mining	X	X	X	X	X	-
Ferromanganese Smelting	X	-	X	X	n/a	n/a
Nickel Mining	-	-	-	-	-	-
Phosphate Rock Mining	-	-	-	-	X	X
Silver Mining	X	-	-	-	X	-
Silver Refining	X	X	-	X	X	X
Zinc Mining	X	-	-	X	X	-
Zinc Smelting	X	-	X	-	X	-

X - indicates decline

68-104 O—80——6

CRS-67

Secular Changes in the Competitiveness of Selected U.S. Mineral Industries, 1953-57 and 1973-77

Mineral Industry	Average Annual U.S. Production[a] (thousands of metric tons)			U.S. Producers' Share of U.S. Market[b] (percent)			U.S. Producers' Share of World Market[c] (percent)		
	1953-57	1973-77	2000	1953-57	1973-77	2000	1953-57	1973-77	2000
Bauxite Mining	398	415	270	25	11[d]	5	11	2	0
Alumina Refining	1,457	3,381	4,900	100	72	39	44[e]	22	9
Aluminum Smelting	1,460	4,340	11,470	96	51	80	45[f]	33[f]	23[f]
Asbestos Mining	42	104	136	6	18	21	3	2	2
Chromium Mining	37	0	0	0	0	0	3	0	0
Ferrochromium Smelting	144[g]	177[h]	90	858	64	17	n.a.	n.a.	n.a.
Cobalt Mining	1.2	0	1.3	30	0	13	9	0	3
Copper Mining	898	1,422	2,700	89	94	95	29	20	15
Copper Smelting	1,000	1,403	2,840	79	94	95	30	19	14
Copper Refining	1,431	1,826	3,700	100	92	95	38	21	18
Iron Mining	53,000	52,000[i]	91,000	84	67[i]	78	30	20[i]	9
Lead Mining	308	561	900	68	89	78	14	16	14
Lead Smelting	983	1,192	1,100	71	94	89	22[f]	18[e,f]	17[f]
Manganese Mining	230	26	0	23	3	0	5	0	0
Ferromanganese Smelting	609	440[d]	450	87	58[d]	36	n.a.	n.a.	n.a.
Nickel Mining	4.5	15	140	5	9	36	2	2	9
Phosphate Rock Mining	14,000	39,000	51,000	100	100	100	45	39	24
Silver Mining	1.2	1.1	1.6	40	63	91	17	12	17
Silver Refining	4.0[j]	3.3	2.8	64[j]	64[k]	39	35[j]	26	16
Zinc Mining	473	433	730	52	72[k]	62	16	8	8
Zinc Smelting	905	535	904[f]	95	82	63	32	8	11

Notes

a. All data are in terms of elemental content except for phosphate rock and asbestos.

b. U.S. producers' share of the U.S. market is U.S. production as a percent of U.S. apparent consumption. Apparent consumption equals U.S. production plus imports minus exports minus increases in stocks held by U.S. industry and government.

c. U.S. producers' share of the world market is U.S. production as a percent of world production.

d. This figure is for the years 1972-76, as information for 1977 was unavailable.

e. This figure is an estimate.

f. This figure is for primary production only.

g. This figure is for the years 1957-61, as information for earlier years is not available.

h. U.S. ferrochromium production reached a peak of 244,000 metric tons contained chromium in 1965.

i. This figure excluded 1977 when U.S. production was greatly reduced by a strike.

j. This figure is for the years 1966-70, as information for earlier years was not available.

k. As imports of zinc metal have been increasing over the past decade, U.S. zinc smelters' requirements for zinc ores and concentrates have been declining. Hence, the U.S. zinc mine producers have appeared to have improved their market share in spite of the fact that domestic zinc mine production has been declining since the mid-1960s.

Source

U.S. Bureau of Mines.

while U.S. production has declined 15 percent, and U.S. dependence for zinc metal has increased from 25 to 50 percent.

The NMPR identified eight economic factors and seven political factors considered to be important determinants of U.S. competitiveness. They include ore quality, labor costs, transportation costs, technology, energy costs, capital availability, management, public-land policies, antitrust policies, tax policies, government subsidies and promotional policies, government restrictions and nationalization, political instability, and environmental, health and safety regulations.

As noted earlier in this report, U.S. Government policies impact these factors. For example, the U.S. limits the use of Federal lands for mineral exploration, imposes strict environmental requirements on domestic mineral projects, restricts the use of joint ventures to pool resources and share risks, adds to labor costs by imposing worker health and safety requirements, etc. It has been suggested by some that many of these governmental policies have little impact; however, others argue that it is this cumulative effect of a variety of government actions coupled with foreign encouragement of their mineral industries that is weakening the U.S. mining and mineral processing industry. This in turn, they warn, will lead to futher foreign dependence.

A decline in competitiveness of the mining industry has other disadvantages for the United States. Increasing foreign dependence can also mean at least temporary unemployment domestically and an increasing balance of payments deficit abroad; it can also pose a threat to U.S. national security.

VI. SUMMARY AND CONCLUSIONS

During the last thirty years, various national commissions, cabinet committees, studies, and reviews have addressed mineral policy issues such as the long-range supply and demand outlook, the estimated extent of shortages and dependence on foreign sources, and the consistency and adequacy of Government policies to meet anticipated problems. And yet, most of the problems and issues reviewed by these studies are still issues today. At the same time, the United States is becoming increasingly dependent on foreign sources for a number of nonfuel minerals. The United States is more than 50 percent dependent for 19 nonfuel minerals. Future supplies of manganese (98), chromium (90), cobalt (90), and the platinum group metals (89) are becoming less secure.

Imports of raw and processed nonfuel minerals totaled $24 billion in 1979, up from only $7 billion in 1973, and the general trend is toward increased reliance on imports in the future.

It also appears that various segments of the United States mining and mineral processing industries are becoming less competitive, and a number will experience a decline in their share of the domestic market by the year 2000. Many blame Federal policy or a lack of policy at least in part for this decline. While previous studies have concluded that it is neither possible nor economically advantageous for the United States to become self-sufficient in mineral production, these same studies have favored increased domestic exploration, development, and production of nonfuel minerals.

However, a variety of Government policies such as land withdrawals; defects in the 1872 mining law; antitrust policy; and environmental, health and safety regulations inhibit increased production.

Problems in Developing a Nonfuel Minerals Policy

If major inconsistencies do exist, why hasn't the Federal Government acted on these in response to the recommendations of previous studies? The Congress recognized the importance of mineral resources to national welfare by enacting the Mining and Minerals Policy Act of 1970 and the Federal Land Management Act of 1976. However, it must be concluded that there are major impediments to the development and implementation of non-fuel mineral policies. These obstacles appear to be rooted in the diversity of issues and the number of congressional committees with a legitimate interest in the outcome of any legislation in this area. This requires many segments of Congress to act affirmatively to establish new policies, amend past actions, or provide financial resources.

William Vogely suggests that much of the difficulty in establishing an explicit minerals policy is found in a reluctance to accept the fact that the mineral sector requires, or should receive, special attention:

> The call for an explicit materials policy by the Congress and the Executive may well be a futile one. Our Executive and Legislative Branches are extremely reluctant, unlike Europeans, to express explicit sector policies. As far as I know, the only such policy expressed from a production side is agricultural policy. The attempt to develop an energy policy in face of a known, or at least perceived, problem does not give much hope.
>
> The difficulty lies in the fact that our political institutions, unlike the European ones, are not directed at the balancing of the needs of all groups through a representative lower house of Congress. Consumers, environmentalists, producers and other interest groups, large and small, all have their representatives on the Hill. Thus, Congress tends to pass legislation that does not relate directly to any particular interest group.
>
> I think a major reason that there is no minerals policy is that the case for such a policy has not been made; but even if the case is made, the chances of enactment of an explicit minerals policy are extremely small. Earlier, I indicated that the case was not made because it was based upon commodity analysis. I will go further than that -- the major threads that one sees in the case are: one, minerals are essential and, therefore, are special; two, minerals are imported and that is bad.

Neither of these arguments can stand up under rational discussion. Labor, capital, materials, land, energy, and technology are all essential. Without any one, there will be no production. The point that materials are unique, in that production without them is impossible, equally applies to the other factors in the production function. And to argue for a materials policy because of their contribution to the production function is simply fallacious.

Also, the position that for these commodities the United States must be self-sufficient overlooks the inherent adaptability of the economic system and the fact that stocks can provide for an interruption of supply for significant periods of time.

So the road to minerals policy is a difficult one. The fact that some 32 major studies have been conducted since 1950, averaging over one a year, indicates there must be some fire if there is all that smoke. 37/

Legislative Options

There are several legislative paths which could be followed to construct a national program for minerals.

An attempt could be made to develop comprehensive legislation which would include all or most of the policy issues addressed in this report. However, as noted, there are a number of committees of both the House and Senate with jurisdiction over various aspects of such legislation. The coordination and compromise required to achieve omnibus legislation would be extremely difficult. Previous congressional and executive branch attempts of this kind have been unsuccessful. The experience of the Congress in attempting to develop a national energy policy is a case in point and demonstrates the difficulties involved even when the need for action in the energy arena was widely recognized.

Another option is an incremental approach which would require prioritizing the problem areas and treating them one at a time or several simultaneously

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37/ Materials and Society, Vol. 3, 1979, pp. 193-194.

through more than one committee. The chances of enacting legislation in this building block mode, while demanding, would seem to stand a greater chance of success. Resources of several committees could be focused on an array of the most promising issues. Such an approach could begin as part of the current consideration of Federal organization (H.R. 2743), now pending in the Senate. This could then be followed by a planned series of legislative reviews of various minerals policy issues during the 97th Congress.

A third option involves committee oversight of the various policy issues addressed in this report. This is based on the recognition that some concerns need not involve the passage of new legislation. For example, it has been argued that the Department of Interior already has the necessary authority to review withdrawn lands which are believed to have high mineral potential, and to reopen them for exploration and development. It is further argued that the Department of Interior has chosen to ignore those statutes which conflict with its environmental philosophy. Oversight hearings could be useful in enforcing congressional intent.

Regardless of the option, it should be recognized that any attempt to shape our national minerals posture will require a heavy Member and staff commitment over an extended period.

Senator FORD. I am very pleased this morning to have as our first witness the distinguished Congressman Don Fuqua.

Don, would you like to come forward and present your statement? Your time is valuable and I know you have a lot of things to do.

STATEMENT OF HON. DON FUQUA, A U.S. REPRESENTATIVE FROM THE STATE OF FLORIDA

Mr. FUQUA. Thank you very much, Senator Ford, and I appreciate the opportunity to be here this morning to testify on the bill H.R. 2743, the Materials Policy, Research and Development Act, as well as the Senate draft of that bill now under consideration.

Since I have already submitted a more comprehensive statement in testimony before the Senate Commerce, Science, and Transportation Committee,[1] today I would like to mention only a few brief points.

First of all, as I mentioned in that testimony, the House Committee on Science and Technology has been considering materials-related problems for a number of years. The present bill, H.R. 2743, follows in succession a number of earlier bills introduced in the 94th and 95th Congresses. This bill after numerous hearings, seminars, and briefings was reported out of our committee and passed on the House floor last December by a vote of 398 to 8.

Our hearings pointed up a number of materials-related problems which faces the United States, not the least of which is our growing import dependence on strategic and critical materials. Many of the countries from which we obtain our materials do not necessarily share our political and/or economic interests. It would thus appear that we are at about the same point with respect to materials as we were with respect to petroleum a decade ago.

Domestically, our basic materials industries are facing intense international competition with current policies by the Government and the industry making necessary innovations difficult. Governments such as Japan and West Germany are investing heavily in materials research in an attempt to leapfrog current U.S. preeminence in the fields of microelectronics and computers, among others.

Most of our advanced energy technologies, including solar, coal, fusion, and magnetohydrodynamics depend on the resolution of materials technologies or problems. The disposal of toxic and nuclear wastes is based primarily on materials technology development.

The President's recent Global 2000 Report underscores other startling facts. At the present, the industrialized countries representing 25 percent of the world's population consume 75 percent of the world's natural and primarily industrial resources.

Assuming a world population of 3 billion and assuming that those 3 billion escalated their standards of living to the same as that of the United States, key materials such as zinc, tin, lead, and copper would be expended in less than 12 years. A projected increase of the world population to over 6 billion by the turn of the century will only exacerbate an already severe, if not critical, situation.

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[1] See hearing of July 1, 1980, before the Senate Committee on Commerce, Science, and Transportation.

We consider H.R. 2743 as only a beginning step in trying to deal with a few of the problems associated with this complex issue. As passed by the House, we focused primarily on aspects of those problems related to materials research and development while at the same time recognizing the need for broader action.

The Senate revisions have enlarged somewhat the scope of the original measure but will hopefully help sharpen implementation actions to be undertaken by the President and the executive branch. However, both measures as now written will require the President to act rather than simply restudy the problem.

Mr. Chairman, we have tried to work closely with the Senate in arriving at a final bill to ensure swift passage in both Houses. In comparing our two bills, I would emphasize the following:

Questions of supply—discovery, extraction, and beneficiation must be balanced with questions of use such as conservation, substitution, recycling, and disposal.

A balance should be made between the strategic and economic concerns in any final legislation.

Long-range assessment, vitally important if we are to avoid lurching from crisis to crisis, must be incorporated more fully.

Overall responsibility must reside within the Executive Office of the President—not at individual department level; this responsibility could reside within OMB, OSTP or some other equivalent entity. In any event, policy direction must come from the top and not the lower ranks of the agencies. I would like to underscore that, Mr. Chairman.

I understand that you have less than 30 days to act in reporting back this legislation. I would strongly urge and hope that you and the Energy and Natural Resources Committee will be amenable to acting swiftly on this bill. Though the problems and solutions related to materials requires looking to the future, we must begin by taking action now.

I look forward to working with you and other Members of the Senate in this endeavor. I would be happy to answer any questions at this time.

Senator FORD. Thank you very much, Don, and I appreciate the detailed report that you made to the Commerce, Science and Transportation Committee.

Would you expand a little bit on the growing import dependence for strategic and critical materials? You know, we have gone through a couple of those. We went through rubber in World War II and we are now hitting petroleum and we are trying to accommodate that basically with synthetic fuels, conservation, and other items.

Would you just want to expand on how much trouble we might be in unless we move fairly rapidly?

Mr. FUQUA. Senator, let me put it this way. Right today for every fighter aircraft basically of the F-16- or F-18-type class, there is approximately 1 ton of cobalt used in that airplane. A 747 type airplane, there is about 2 tons utilized of cobalt in the manufacture of that airplane.

We now get most of our cobalt from one country and that price has risen I think something over 900 percent in the last year or two. Now here we are, a country that is called upon by the free

world to lead in the defense, to try to maintain peace and stability in the world and one of the most critical elements, not only in making aircraft but other alloys, is a product that we don't even produce in this country.

I don't know that we are making any effort to manufacture a synthetic or substitute for cobalt. You and I spent numerous months and weeks on the synthetic fuels bill that we probably should have passed in this House, or in the Congress, in 1973 when we first got hit in the face with a petroleum crisis.

But we didn't do that and I hope we don't do that in our materials, wait until we are in a crisis situation before we respond. Our allies, West Germany and Japan as I mentioned, are already spending huge sums of money in these areas right now.

We know that in the computer industry and others that I have outlined that this country is at the verge of—if it hasn't already, certainly on the verge, of losing the leading edge we have had in technology that means so much. These materials are all part of that and I emphasize again that I think the time has come to act and not restudy the situation.

Senator FORD. Don, you are leaning heavily on the economic aspects of it and yet you refer to military aircraft. Can you give me your feeling as it relates to the economic aspects, as it relates to the strategic aspects of our Materials Production Act? We have the Defense Production Act, as you know, and some other things.

Mr. FUQUA. Senator, the problem as I see it does affect us economically because of the competing countries that we have as I outlined, West Germany and Japan, who are already spending vast sums of money in this type of research.

Economically it matters whether we will be supplying this to the world or they will be supplying it, this advanced technology. If it does mean that we have to buy it, in addition to the huge sums of funds that we have to spend now in the purchase of oil, this year it will probably be over $90 billion as you are well aware of, this could be the next oil crisis we have and economically it can drain this country.

If you pick up a wrench, it has some type of cobalt in it as an alloy to hold it together, tools, dies, many things that we take for granted. If this country has to depend on other people for this production, not only do we lose jobs in this country in producing it, but we also become totally dependent on someone else for supply and I don't think we can afford to do that economically or any other way.

Senator FORD. Don, do you have any figures as to what the United States is spending in materials research compared to Japan and West Germany, for instance? You alluded to that.

Mr. FUQUA. There's about $1 billion in Federal research and about $4 billion in industrial research, I am informed. I think we are still probably ahead of the other countries, but they are spending vast sums and they have increased their spending in materials research considerably over the last few years.

Senator FORD. You hit a balance that helps me a little bit, you say the overall responsibility must reside in the Executive Office. I serve on both the Commerce and Energy Committee and you know the Commerce Committee with Commerce and the Energy Commit-

tee with Interior so I am comfortable with what you are trying to do. It looks like you are trying to arrive at a balance to keep it some place other than to fight over which department it belongs to.

Mr. FUQUA. I think from an organizational standpoint, Senator, it is a matter that cuts across many other fields. It can involve Interior because it may be on Federal lands that many of these materials may be. It can involve Energy because it can affect energy and energy technologies that we may need.

It can affect Commerce because it certainly is involved in commerce. It can affect the Department of Defense because it certainly has defense implications. I think to have an overall policy, not that the President has to involve himself day to day, but because it cuts across so many of the agencies, that it should be housed somewhere that it will get overall review and direction rather than get caught up in the bureaucratic fight that could happen if it were lodged in one of the departments.

It can be a catch-22, it involves a lot of things and I think it would be much better if it were housed in OMB or the Office of Science and Technology Policy at the present. But somewhere at that level, it could cut through and work with all the agencies and departments that may or may not be involved.

Senator FORD. I think you have hit a pretty good nerve where the program is carried out under the various acts and various departments rather than having it lodged in one place or another and you will get into the political rhetoric that we would get into.

Don, I don't have any other questions but I appreciate your coming this morning and we do have the Commerce Committee's statement that we are dealing with. I might just say that I am sure you have seen this, when you refer to cobalt, 97 percent of it comes from outside the borders of this country.

I guess Zaire is the major contributor of that and a little bit from Zambia and Finland and so forth. It does indicate that if we had 97 percent of it cut off today, we would have some problems.

Mr. FUQUA. Very serious problems.

Senator FORD. Don, you are a very thoughtful person and I appreciate seeing you here this morning and I look forward to working with you in the future on this. I hope we can get it out in some sort of positive form within the 30-day period and thank you for being with us today.

Mr. FUQUA. Thank you very much.

Senator FORD. The next witness is Dr. Frank Wolek, Deputy Assistant Secretary for Productivity, Technology, and Innovation, Department of Commerce.

Good morning, sir.

STATEMENT OF DR. FRANCIS W. WOLEK, DEPUTY ASSISTANT SECRETARY, PRODUCTIVITY, TECHNOLOGY AND INNOVATION, DEPARTMENT OF COMMERCE; ACCOMPANIED BY DR. DARRELL H. RENEKER, DEPUTY DIRECTOR OF THE NATIONAL BUREAU OF STANDARDS CENTER FOR MATERIALS SCIENCE; AND DR. HARVEY YAKOWITZ, CHIEF OF THE NBS OFFICE OF RECYCLED MATERIALS

Dr. WOLEK. Good morning, Senator.

Senator FORD. You have a rather detailed statement, if you want to hit some highlights of it, we will see that the total statement is in the record, whichever you prefer. I hope you will identify your associates to your left.

Dr. WOLEK. Thank you, Senator, I would be pleased to submit my full statement for the record and summarize it here.

I am pleased to appear today to discuss the role of the Department of Commerce in materials policy and materials research and development. With me to assist in answering any questions you may have are Dr. Darrell H. Reneker, Deputy Director of the National Bureau of Standards Center for Materials Science and Dr. Harvey Yakowitz, Chief of the NBS Office of Recycled Materials.

The Department of Commerce shares your concern with the importance of materials for much of our national economy. The goods and services that individual, governmental and industrial consumers use in their everyday life are fed by a production system that requires a sufficient flow of raw materials.

The Department of Commerce's activities with respect to nonfuel materials may be divided into four areas. The first concerns technological alternatives. The majority of our activities in support of materials substitution, recycling, use, and related production technologies are at the National Bureau of Standards.

These activities provide for more efficient use of materials as well as support processing, manufacturing, and recycling of alternative materials. In fiscal year 1980, approximately $26 million will be spent by NBS in these areas. As you may be aware, NBS has been intensively involved with materials research and development since its formation in 1901.

The basis for this long-term involvement in materials is found in section 2 of the Bureau's Organic Act (15 U.S.C. 272), where Congress has assigned to NBS specific responsibilities for the analysis and characterization of materials, for ways of specifying and testing materials and for the evaluation and tabulation of the physical and chemical properties of scientifically and industrially important materials.

These activities are described in detail in the appendix which is attached to my written statement.

In recent years, Congress has assigned the Department of Commerce new responsibilities in the recycling and substitution field. In 1975, section 383(c) of the Energy Policy and Conservation Act (42 U.S.C. 6363(c)) assigned NBS responsibility for developing test procedures for determining the substantial equivalency, relative to new oil, or rerefined oil.

Further, amendments made to the Solid Waste Disposal Act by the Resource Conservation and Recovery Act of 1976, Public Law 94-580, also assigned DOC new responsibilities. As a result of these new assignments, NBS has a program to develop guidelines for use in classifying materials recovered from waste.

This is an extremely important step in the effort both to reduce the economic and environmental costs of disposal and to conserve by recycling valuable materials resources that would otherwise be lost. These activities are also described in more detail in the attached appendix.

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Finally, in response to Public Law 90-396, the Standard Reference Data Act of 1968, the NBS evaluates and disseminates scientific and engineering data from the world's scientific literature. Twenty-two specialized data centers collect, compile, critically evaluate and disseminate data in user-oriented formats in four major areas: Materials durability and resource recovery, process design, energy applications, and environment and health.

As part of the President's plan to increase innovation and productivity, the Office of the Assistant Secretary for Productivity, Technology and Innovation is planning the establishment of cooperative generic technology centers to undertake R. & D. in key industrial areas which we expect may include such materials-related tasks such as surface modification and improved metallurgical technology.

The second area of the Department's responsibilities lies in the field of data availability, that of monitoring the flow of materials in our economy and projecting of demands. The Bureau of the Census monitors the flow of classes of raw and engineering materials as part of the census of manufacturers.

The Office of Basic Industries in the Department's Bureau of Industrial Economics draws on data from this census and other sources to develop analyses of consumption, supply, and domestic production capacity for industrial materials.

While the Department of Commerce has responsibility for monitoring national supplies of engineering materials and for recommending corrective measures where necessary, the Department does not have the responsibility or the capability to monitor all materials as that term is used in H.R. 2743 or the Senate version. Other Federal agencies also have considerable expertise and experience in the field.

The third area of departmental activity is that of exploration for and recovery of minerals. The National Oceanic and Atmospheric Administration will be establishing a framework for Federal licensing of industrial exploration and recovery of minerals from the deep seabed.

This regulatory framework will encourage the private sector to make the investment commitment that it has been reluctant to make pending resolution of the Law of the Sea Treaty. The private sector will now be encouraged to act. Reciprocal legislation with other countries will also be facilitated.

Last month the Senate Commerce, Science, and Transportation Committee in its planning for a civil operational land remote sensing satellite system was briefed by Administrator Richard Frank on the options NOAA is now considering for this new system. Such satellites are an extremely promising tool in the search for new land mineral deposits.

The fourth area of activity is the assurance of defense supplies. In this area, the Department of Commerce shares responsibility with several other departments for implementation of the Defense Production Act of 1950.

I would now like to turn to recent actions by the administration. Over the past winter, Dr. Frank Press, Director of the Office of Science and Technology Policy, established the Committee on Ma-

terials—COMAT--as a subcommittee of the Federal Coordinating Council on Science, Engineering and Technology.

This committee has been established at the Assistant Secretary level and is chaired by Dr. Edward Frieman, Director of the Office of Energy Research of the Department of Energy. COMAT has focused on the coordination and Federal policy aspects of strategic nonfuel minerals as its first area of concern. The committee has already met twice to assimilate background information and has asked the various Federal departments to define areas of departmental concern.

With respect to H.R. 2743 and the Senate draft, we believe that legislative initiatives are premature. There is sufficient authority in place and substantial effort underway to address the concerns expressed in the bill. These should be given a chance to work before we direct our attention to the need for this legislation.

Mr. Chairman, we appreciate the concern and efforts of the Subcommittee on Energy Resources and Materials Production to develop national policies for dealing with the entire materials cycle. We look forward to working with you and your staff toward attainment of our common goal.

Senator FORD. Let me ask you what coordinating efforts are in place now?

Dr. WOLEK. The Committee on Materials or COMAT of the Federal Coordinating Council on Science, Engineering, and Technology or FCCSET.

Senator FORD. Does that address all the issues?

Dr. WOLEK. That addresses substantial issues in the area of research and development and coordination of projects in that field. Furthermore, in projecting the needs that we have for critical materials and how the Government is responding to those.

Senator FORD. It is basically research and development you are talking about though, isn't it, R. & D.?

Dr. WOLEK. In order to look at the R. & D., you have to understand what our problems are. We believe firmly that R. & D. should not be separated from a sound understanding of industrial development. What we do and what FCCSET does is understand what are the requirements of industry and what are the requirements of the defense community for materials. We and FCCSET look at projections in those areas and in that context we try to formulate the needed R. & D. policies.

Senator FORD. On Page 5 you state:

> While the Department of Commerce has the responsibility for monitoring national supplies of engineering materials and for recommending corrective measures where necessary, the Department does not have the responsibility or the capability, or the capability, to monitor all materials as that term is used in H.R. 2743 or the Senate version.

What would you have to do to have the capability to do it?

Dr. WOLEK. Senator, I think it is very important, in the same sense that I tied research and development to an industrial context. I think it is also important to tie the monitoring capabilities, the staff role that you have, to an operating responsibility.

The Department of Commerce is not involved as an operating agency in the full range of all the materials and material types of concerns that affect our economy and defense posture. This separa-

tion between the mission oriented responsibilities and the staff capabilities is what I was referring to there.

It's not just a question of adding people or adding a few experts but it is a question of having the mandate to work in those areas on a day-to-day basis and to carry out mission responsibilities.

Senator FORD. You lean very heavily on research and development and in that context, nobody is really in there looking at overall structure to bring it altogether to have some kind of responsibility as it relates to the availability of the supply, what the strategic position might be as it relates to the economy.

It seems to me, of course I understand where you are coming from, but you are not necessarily for either piece of legislation. When you are not for either piece of legislation, you give us the comments that you prefer not to have the legislation and let's keep on going our merry way.

I keep on going back to the embargo of 1973 and 1974. That was a hell of a flag and we waited until 6 years later before we really put things into place. I don't think we can wait that long, looking at the complex situation of the world.

Are you trying to tell us that everything is going fine and we don't have to worry about any of these types of materials?

Dr. WOLEK. No, the Department and the administration both share your concerns. Insofar as those concerns bear upon critical shortages of materials used in current practice, we do attempt to forecast what our needs will be. The Department of Defense and the Department of Commerce share activities of that nature. For example, take implementation of the Defense Production Act or maintenance of stockpiles of critical materials.

In addition, information is fed back into research and development planning where we look at the longer term and try to come up with programs for developing substitute materials, programs for developing technologies which will limit the needs for materials that have not been identified as critical, and programs for identifying and promoting technologies which can recover and recycle important materials from our wastes.

We do share those concerns and the administration is attempting to use, and we feel we can use, the authorities and capabilities we already have to carry out that mission.

Senator FORD. Congressman Fuqua alluded to cobalt a few moments ago and how much was in a fighter plane and how much in a 747 and how much would be involved as it relates to making tools for industry and even carpentry . What if Zaire turned off all our supply and embargoed today? What can you do to help us out of that dilemma?

Dr. WOLEK. I share Congressman Fuqua's concern about that, cobalt is one of the critical problems in the materials area facing this country.

We have a stockpile of cobalt supplies that we are maintaining for use, should our sources be cut off. Furthermore, we are looking at substitute material.

Senator FORD. How long will the stockpile last?

Dr. WOLEK. I'm sorry, I don't have the exact answer to that.

Senator FORD. You don't have the answer for a substitute for cobalt either, do you?

Dr. WOLEK. We are working strongly on that and I would like to turn to Dr. Reneker to describe some of the activities, if you would like, in that area.

Dr. RENEKER. The kind of approach we are involved in at the Bureau of Standards involves substitute materials, other designs of aircraft that did not rely so heavily on cobalt, other materials that could be substituted in place of the cobalt, more efficient ways of using cobalt, less waste in the processing of the material that would make the stockpile last longer.

Senator FORD. Is there any place we could go, any one place we could go and find out how far along you are, how much is in storage, what your substitute materials are, if they are available, those sort of things? Is there any one place we could go to get all the information? Can we call it up on a computer?

Dr. WOLEK. No, you can't call it up on a computer.

Senator FORD. Just simple coordination of R. & D., is that out there?

Dr. WOLEK. The coordination of R. & D. on that issue is available through COMAT. The question of being able to identify how much is in stockpile and what are our projected needs and what are the different capacities in various countries, I believe that the Department of Commerce has that information in the Bureau of Industrial Economics and I would be glad to provide it for the record if you wish.

Senator FORD. So you are coordinating with the Defense Department and other agencies, they all know where you are and you know where they are?

Dr. WOLEK. Yes, Senator.

Senator FORD. Yet you don't have the capability to monitor all materials as that term is used in either one of the bills?

Dr. WOLEK. That's correct, sir.

Senator FORD. Do you have any guesstimate as to how much you would have to have in order to be in a position to be capable?

Dr. WOLEK. No, Senator, I don't.

Senator FORD. In the letter that was sent for the hearing today, several questions were attached to the Department's letter of invitation. Some of those questions have been addressed in your written statement today but others have not. Any reason for answering some and not the others?

Dr. WOLEK. There was only a short time period in which I had to prepare my testimony. I will provide written answers to the remaining questions.

Senator FORD. In what time frame can you complete those answers for us? We have a short fuse on the bill.

Dr. WOLEK. Yes, Senator, I will have answers within a matter of days.[1]

Senator FORD. By the end of next week?

Dr. WOLEK. By the end of this week.

Senator FORD. The end of this week, all right, that's in the record.

Dr. WOLEK. Right on.

Senator FORD. Right on, yes, sir. If you have not had an opportunity to deal with me, you will.

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[1]See p. 119 for answers to written questions supplied by Dr. Wolek.

Dr. WOLEK. No, I have not had that privilege. [Laughter.]

Senator FORD. If you say the end of this week, I would be looking at Friday afternoon's mail.

Dr. WOLEK. Fully expected, Senator.

Senator FORD. Fair warning. I don't believe I have any other questions. We do have the good fortune to have the testimony that we can look at from the Commerce Committee.

Let me ask you this, if just by chance a piece of legislation is passed, just in case you might have to live with it, Congressman Fuqua made a statement in his statement that he wanted it to be in the Executive Office, maybe OMB. Do you have any particular feelings about that?

Dr. WOLEK. It's difficult to comment since the Department of Commerce has an important responsibility in the Senate draft version. Speaking personally on that matter, I would not be overly concerned about the bureaucratic problems, political infighting between agencies.

I am working right now as a vice chairman of the Guayule Commission with the Department of Agriculture. I am working very cooperatively with the Department of Agriculture, the FEMA, the Department of Defense, the Department of the Interior, and the National Science Foundation.

When you have a clear mission mandate in a critical area of national importance such as the cobalt, chromium or surface modification technology, we find is is easy to get various agencies together. I would not be concerned about political infighting with this type of issue.

The other aspects to the question are something that I would prefer to leave to the Senate and its deliberations.

Senator FORD. In other words, you want to leave it to our good judgment?

Dr. WOLEK. Yes, sir.

Senator FORD. That's encouraging. I think that's all I have for now.

Senator Bumpers.

Senator BUMPERS. Let me ask you a couple of questions because I am not familiar with this legislation. In a nutshell, what is the thrust of this bill?

Dr. WOLEK. The thrust of this bill is to establish some mechanisms by which there is a capability for coordinating Federal activities in materials.

Senator BUMPERS. Well, that doesn't tell me very much, what are you going to coordinate and for what purpose?

Dr. WOLEK. The bill would have us coordinate Federal activities with respect to the monitoring of materials needs and this Nation's capacities for fulfilling those needs. Also it would have us coordinate activities, export and import activities affecting material, and stockpiling activities.

Under the bill, we would coordinate our research and development activities directed toward finding alternative materials.

Senator BUMPERS. Is this an administration bill?

Dr. WOLEK. No, it is not, Senator.

Senator BUMPERS. Whose bill is it, does anybody know?

Dr. WOLEK. Senator, offhand I don't know who is the author.

Senator BUMPERS. Is Don Fuqua the author of this?

Senator FORD. Yes.

Senator BUMPERS. I think it's an extremely important bill. I am supposed to be in another subcommittee but because of my interest, I wanted to come down and hear some of this.

Let me ask you, where do the Japanese get their iron ore?

Dr. WOLEK. I don't know the answer to that, Senator.

Senator BUMPERS. Does anyone in this room know?

VOICE. Australia.

SECOND VOICE. On the way back, they are supposed to pick up iron ore or other materials of that type.

Dr. WOLEK. I thought you meant a detailed answer by country.

Senator BUMPERS. That's what I meant.

SECOND VOICE. I don't know whether it's Africa or here in this country, or no matter where they are. They don't go back empty bottomed in other words, sir.

Senator BUMPERS. Does this bill envision, I assume it must, determining the supplies we have left in this country based on current uses and so on and expanded uses?

Dr. WOLEK. Yes, Senator, my understanding of the bill is that that would be involved.

Senator BUMPERS. What do you think are some of the most critical materials that we are about to run out of? Of course, they are all finite supplies.

Dr. WOLEK. One has been mentioned already—cobalt.

Senator BUMPERS. Do we produce any cobalt? I don't mean worldwide supplies but in the United States?

Dr. WOLEK. Domestically, we produce 3 percent of the total that we need. It's largely the byproduct of the production of other materials.

There are some 18 different minerals listed on critical materials needs of industry and Defense Department which we import, the vast majority of. We import a great deal of chromium—a very important critical material. We import a great deal of titanium, another important mineral.

Senator BUMPERS. Where do we get titanium—I see, Canada and Australia.

Let me ask you this. I notice grocery stores are putting out sacks that say if you return this sack, you get 3 cents credit which I think is a healthy thing. You take your own bag to the grocery store to pick up your groceries.

Dr. WOLEK. I do it in Crystal City in the Safeway.

Senator FORD. You do it as an individual, you don't do it because you want to. When I go to the grocery store, I am looking for it to be sacked.

Dr. WOLEK. I do it for the 3 cents, Senator. [Laughter.]

Senator BUMPERS. My point is, of course I think this is a very healthy thing and I think the paper industry would probably discourage that on the part of Safeway and Giant and all the grocery stores doing that. Is that not the case?

Dr. WOLEK. You are talking about the area of resource recovery and I would like to turn to Dr. Yakowitz who is an expert in that area.

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Dr. YAKOWITZ. The paper industry as an industry encourages recycling wherever it can and this has to do with its policies with respect to——

Senator BUMPERS. This is not recycling, it's reuse.

Dr. YAKOWITZ. It's reuse and the reuse of the bag probably costs them a few cents but not that many people bring it back for 3 cents. It is a method of encouraging short supplies of tree and other wood resources so the paper industry encourages rather than discourages such an activity. As you say, it's definitely a reuse of material.

Senator BUMPERS. It seems to me one of the biggest problems we have, this bill is a fine bill. If you read this new report, Global 2000, which I scanned last evening, you don't have to be—My problem in this country and the whole Department of Energy is that everything is finite, almost everything.

The only thing you have ultimately is timber that is a renewable resource plus related agricultural products. The rest of it we will run out of. Yet when you talk about conservation, I don't want to get partisan about this, but there are those in this country who would assume that if you just get Government out of their hair, everything will be coming up roses for the next century and it isn't.

These things are finite we are running out of them, we are wasting it, we are using them exponentially every year. But every time you suggest an alternative to any particular use of a particular product because it is wasteful, you run into a fire storm from economic interests who have more than a passing interest in the continued use of that material until the last drop of it is gone.

That's the real problem in this country and this is a major first step and I think we ought to get cracking with it. We ought to identify these minerals, determine what the supply is and what the alternatives are going to be if we continue to use them the way they are now and how we might develop alternatives to the use of critical materials right now.

For the most part, I would be willing to bite the bullet and cast a few unpopular votes to do that. But isn't that one of the most difficult things facing this country and that is the economic protest for the discontinuance of the wasteful use of a critical material?

Dr. WOLEK. Senator, in my experience I have not noticed that, particularly in reference to these materials that we are heavily dependent on imports for. Most of the contacts I have had with industry on the question of cobalt and chromium are extremely supportive of the need of Federal activities to try to find substitutes, to try to find technology that limits our needs for those.

Senator BUMPERS. You see, that's one of the things I object to. That has—that's like my 83-year-old father-in-law. He says, well, our technology will find a way, we will find a substitute, we will find an alternative. That's fine and I admire his confidence and I think it is justified to a point. When you go beyond that point, it is not.

Let me ask you this. It is my understanding that there are only two ways to transmit electricity; one is with copper and one is with aluminum. Is that a fair statement?

Dr. WOLEK. No, you can also transmit it with other metals. You wouldn't want to, some of them are very expensive.

Senator BUMPERS. Well, you can do it with gold and silver, but you are not going to suggest that, are you?

Dr. WOLEK. No.

Senator BUMPERS. What other metals can you transmit electricity with besides gold, silver, aluminum, and copper?

Dr. YAKOWITZ. You can transmit electricity by using any conductor but most conductors are not economical. This country did use silver to some extent during World War II because our supplies of copper were cut off.

Senator BUMPERS. Let's be realistic. In today's society, can you think of any metal that would be a simple substitute for copper and aluminum?

Dr. YAKOWITZ. In the transmission of electricity, no, sir, I can't.

Senator BUMPERS. Let's not get into semantics then. We are talking about two finite supplies. I got into an argument with someone from the University of Arkansas at one time about aluminum. He was sitting in the Governor's mansion and he pointed out to the spacious lawn and said there's aluminum out there. I said how much and he said, well, it would depend, we would have to assay it and determine it and in all probability you might get a pound out of that 5 acres out there.

I said are you suggesting we take up the mansion grounds for a pound of aluminum and he said no, nothing like that. All he was saying was that it is found everywhere but that begs the question. The truth is that my State, which is the only State in the Nation that produces bauxite from which aluminum is made is out and it's a poor quality what we have left.

We have the Mexican and Jamaican bauxite, and about 60 percent Jamaican and 40 percent Arkansas mix. I am making the point, it's probably not going to be a big deal with me, but it will be with my children and grandchildren and when you compound that with the ominous forebodings of this interagency report that just came out over the weekend about what will happen in this country when the world will have 6½ billion people. They're talking about what will happen 20 or 40 years down the pike and they couldn't care less about that.

Dr. WOLEK. I don't think it is begging the question to refer to the capabilities to produce aluminum from clays that are freely available. What we have here is a market system that we are working on. The administration is attempting to develop policies to create a cooperative relationship with the free market economy, with private industry in being able to respond to these needs.

We have a market system driven by a price mechanisms. If the price raises high enough on a consistent basis, then industry will respond by putting technologies into practice that will produce the material. There are many technologies already available.

The question is whether use of these technologies is worth it right now given the current price of cobalt, aluminum, or chromium. If there is just a short-term price spike, the technology will not be employed.

If the price stays up on a steady trend, then technology starts becoming used. Private sector activity makes the technologies

available. It is the private sector that has the marketing, and production skills, and which has the vast amounts of capital that is required for those technologies to be put into practice.

What we in Government are attempting to do is to anticipate them and provide the infrastructure of technical knowledge, scientific knowledge, and business knowledge, economic knowledge, so that when they finally make that decision that the market mechanism has dictated the need for those substitute materials or substitute sources, we have already provided something on which they can build, they have the direction to go. We have to wait for the economy to make that final determination.

Senator BUMPERS. If we continue to use iron ore on our own in this country at the rate we are using it right now, how many years supply do we have left?

Dr. WOLEK. It depends on the price you want to pay for the iron ore.

Senator BUMPERS. I'm not talking about price, I'm talking about quantity of iron ore. You continue to use it at the rate we are using it right now, how many years supply do we have left in this country?

Dr. WOLEK. The definition of ore is something that involes economics that is, the definition is related to what the costs of recovery are. We have tremendous reserves of iron buried in trash heaps all over this country that could be recovered. Right now the cost of recovery is too high relative to the price of iron from other sources.

Senator BUMPERS. I'm talking about the raw material.

Dr. WOLEK. If you are talking about ore like taconite, we have vast resources in Minnesota.

I don't know how many years supply we have—but it is a finite amount.

Senator BUMPERS. How much recyclable iron and steel goes into American automobiles?

Dr. YAKOWITZ. I can't give you an exact answer to that but what we do with automobiles these days is to shred them and take the metal units out of them, the iron and other metal units come out of them and are recycled at many factories throughout this country, whereas 10 years ago, 12 years ago, that was not done. I could not give you a proportion of recycled steel in a new automobile, I do not know.

Senator BUMPERS. Incidentally, in those shredders where you do that, that stuff is melted down, is it not?

Dr. YAKOWITZ. Yes, it is melted after it's taken out. It comes out of the shredder in about fist sized pieces of steel and then the pieces are melted and reused in steel manufacturing.

Senator BUMPERS. How are the various metals in the shredder separated? Is that after the smelter or before?

Dr. YAKOWITZ. Before. The shredder has an air classifier that blows the material and the light material is blown upward and the heavy material falls to the bottom and the steel is separated magnetically.

Senator BUMPERS. There's more than steel in it?

Dr. YAKOWITZ. Yes, there is aluminum, copper and other things.

Senator BUMPERS. How do you separate those things?

Dr. YAKOWITZ. The steel is separated from aluminum magnetically, aluminum not being a ferromagnetic material. It's put through a series of heating processes to come out with what is referred to as recycled secondary ingot. From the aluminum, one can obtain a small amount of zinc. One foreign car manufacturer in order to comply with recycling laws in his country has designed his cars electrical systems such that by pulling one harness all the copper wires in the system come out.

Senator BUMPERS. How energy efficient is this process?

Dr. YAKOWITZ. With respect to making a car——

Senator BUMPERS. No, steel, just taking steel and melting it down. How does that compare with converting original iron ore to steel?

Dr. YAKOWITZ. It is far more energy efficient to do so. The argument is that a ton of recycled steel would save about 17 to 25 percent energy from virgin steel.

Senator BUMPERS. I won't take any more of your time and I appreciate——

Senator FORD. I think you can understand that there is some interest in this field and I would hope that when you leave here you would get the feeling that there might be some interest in having a piece of legislation that would—maybe you might have some suggestions on how it would work. Thank you very much for your attendance today and for your very fine statement and testimony.

Dr. WOLEK. Thank you, Senator.

[The prepared statement and subsequent information submitted by Dr. Wolek follow:]

STATEMENT OF FRANCIS W. WOLEK

DEPUTY ASSISTANT SECRETARY FOR PRODUCTIVITY, TECHNOLOGY AND INNOVATION

U.S. DEPARTMENT OF COMMERCE

BEFORE THE

SUBCOMMITTEE ON ENERGY RESOURCES AND MATERIALS PRODUCTION

COMMITTEE ON ENERGY AND NATURAL RESOURCES

UNITED STATES SENATE

ON H.R. 2743, THE MATERIALS POLICY, RESEARCH

AND DEVELOPMENT ACT OF 1979, AND THE SENATE DRAFT VERSION

July 29, 1980

Mr. Chairman and Members of the Committee:

I am pleased to appear here today to discuss the role of the Department of Commerce in materials policy and materials research and development. With me to assist in answering any questions you may have are Dr. Darrell H. Reneker, Deputy Director of the National Bureau of Standards (NBS) Center for Materials Science, and Dr. Harvey Yakowitz, Chief of the NBS Office of Recycled Materials.

The Department of Commerce (DOC) shares your concern with the importance of materials for much of our national economy. The goods and services that individual, governmental, and industrial consumers use in their everyday life are fed by a production system that requires a sufficient flow of raw materials. These materials play a role in determining the character, performance, and

longevity of the goods used in the United States. As our Nation becomes more industrialized and mechanized, materials become increasingly important and deserving of focused national attention.

The United States imports substantial portions of a number of the materials that it uses. According to the General Accounting Office in their 1976 report entitled "U.S. Dependence on Five Critical Minerals: Implications and Policy Alternatives," the United States is currently dependent to varying degrees on foreign sources for 22 of the 76 materials currently defined as strategic. A disruption in the supply of some of the materials could well have substantial impacts on our industry and economy.

DEPARTMENTAL ACTIVITIES

The Department of Commerce's activities with respect to nonfuel materials--the "stuff" that things are made of, or with, or could be, including forms that occur in nature and in use--may be divided into four areas.

The first area of our effort involves the limited development of some technological substitutes for products made from critical raw materials. The second area involves the provision of data on industrial demand for raw materials and projections of that demand into the future. The third area concerns the innovative exploration and recovery of raw materials, such as the development of deep sea mining and satellite surveying capabilities. The fourth area is mandated under provisions of the Defense Production Act whereby we work with concerned agencies to assure adequate supplies of materials to meet national security needs. For all of these areas, information activities are conducted by the National Technical Information Service, an organization within the Department of Commerce, which distributes Federally generated technical reports.

Technological Alternatives

The majority of our Departmental technical activities in support of materials substitution, recycling, use, and related production technologies, the first area, are at the National Bureau of Standards. These activities provide for more efficient use of materials, as well as support processing, manufacturing, and recycling of alternative materials. In FY 1980 approximately $26 million will be spent by NBS in these areas. As you may be aware NBS has been intensively involved with materials research and development since its formation in 1901. The basis for this long-term involvement in materials is found in Section 2 of the Bureau's Organic Act (15 U.S.C. 272), where Congress has assigned to NBS specific responsibilities for the analysis and characterization of materials, for ways of specifying and testing materials, and for the evaluation and tabulation of the physical and chemical properties of scientifically and industrially important materials. These activities, many of which are described in more detail in the attached Appendix, constitute an essential infrastructure to science and technology, and they are an essential part of the NBS mission.

In recent years Congress has assigned the Department of Commerce new responsibilities in the recycling and substitution field. In 1975, section 383(c) of the Energy Policy and Conservation Act (42 U.S.C. 6363(c)) assigned NBS responsibility for developing test procedures for determining the substantial equivalency, relative to new oil, of rerefined oil. The lack of such generally accepted test procedures severely limits the use of recycled oil products, and contributes to the dumping and waste of millions of gallons of used oil each year. In November 1978, NBS completed the first phase of this work; we provided the Federal Trade Commission with test procedures related to the use of recycled oil for burner fuel. Now NBS is developing tests needed to assure the equality of recycled oil for use in engine lubrication, industrial applications, and so on. Further, amendments made to the Solid Waste Disposal

Act (SWDA) by the Resource Conservation and Recovery Act (RCRA) of 1976 (Public Law 94-580) also assigned DOC new responsibilities. As a result of these new assignments NBS has a program to develop guidelines for use in classifying materials recovered from waste. This is an extremely important step in the effort both to reduce the economic and environmental costs of disposal, and to conserve by recycling valuable materials resources that would otherwise be lost. These activities are also described in more detail in the attached Appendix.

Finally, in response to P.L. 90-396, the Standard Reference Data (SRD) Act of 1968, the NBS evaluates and disseminates scientific and engineering data from the world's scientific literature. Twenty-two specialized data centers collect, compile, critically evaluate, and disseminate data in user-oriented formats in four major areas: Materials Durability and Resource Recovery, Process Design, Energy Applications, and Environment and Health.

As part of the President's plan to increase innovation and productivity, the Office of the Assistant Secretary for Productivity, Technology and Innovation is planning the establishment of cooperative generic technology centers to undertake R&D in key industrial areas which we expect may include such materials-related tasks as corrosion prevention and improved metallurgy technologies. The President's budget requests $5.2 million for FY1981 for this program.

Data Availability

The second area of our material activities is the monitoring of the flow of materials after mining in our economy and the projecting of demands. The Bureau of the Census monitors the flow of classes of raw and engineering materials as part of the Census of Manufacturers. The Office of Basic Industries in the Department's Bureau of Industrial Economics draws on data from this Census and other sources to develop analyses of consumption, supply, and domestic production capacity for industrial materials.

Using these analyses, the International Trade Administration's Office of Industrial Mobilization participates with other Departments and agencies in assisting the Federal Emergency Management Agency, where the primary Federal responsibility now rests, in developing policies and identifying projects to be funded for enhancing the security of our supplies of raw materials. With regard to the export of materials, the Department's Deputy Assistant Secretary for Export Administration of the International Trade Administration oversees an extensive program which continuously monitors the export flow of materials and its impact on the domestic economy.

While the Department of Commerce has responsibility for monitoring national supplies of engineering materials and for recommending corrective measures where necessary, the Department does not have the responsibility or the capability to monitor all materials as that term is used in H.R. 2743 or the Senate version. Other federal agencies also have considerable expertise and experience in the field.

Before I leave the subject of projection activities, I would stress that, as a natural consequence of our free market economy, the projection of demand for individual commodities is subject to considerable uncertainty. First, the high leverage exerted by relatively small differences in the cost of basic materials leads to uncertainty. For example, the technology of beverage containers has shifted a number of times in the past decade with shifts in the cost of steel, aluminum, tin, plastic, and glass. Second, the introduction of new technology in areas such as coating, forming, and sealing can also suddenly influence the demand for materials, as also illustrated by the rapid shifts in beverage can technology which accompanied the changes in materials. These uncertainties have led Professor John Tilton of Pennsylvania State University to report recently to the National Science Foundation that long-range foracasts of materials demand based on past usage are extremely uncertain.

Innovative Exploration and Recovery

The third area of our activities supports exploration for and recovery of minerals. The National Oceanic and Atmospheric Administration (NOAA) will be establishing a framework for Federal licensing of industrial exploration and recovery of minerals from the deep sea bed. This regulatory framework will encourage the private sector to make the investment commitment that it has been reluctant to make pending resolution of the Law of the Sea Treaty. The private sector will now be encouraged to act. Reciprocal legislation with other countries will also be facilitated.

Last month the Senate Commerce, Science, and Transportation Committee in its planning for a civil operational land remote sensing satellite system, was briefed by Administrator Richard Frank on the options NOAA is now considering for this new system. Such satellites are an extremely promising tool in the search for new land mineral deposits.

Assurance of Private Supplies

In the final area of its materials effort, the Department of Commerce shares responsibility with several other departments for implementation of the Defense Production Act of 1950. The Office of Industrial Mobilization administers the Priorities and Allocations Authorities of Title I of that Act, as amended, to control the distribution of certain materials in our economy to assure that defense requirements for these materials are satisfied on a timely basis.

RECENT ACTIONS BY THE ADMINISTRATION

Over the past winter, Dr. Frank Press, Director of the Office of Science and Technology Policy, established the Committee on Materials (COMAT) as a Subcommittee of the Federal Coordinating Council on Science, Engineering, and Technology. This Committee has been established at the Assistant Secretary level and is chaired by Dr. Edward Frieman, Director of the Office of Energy

Research of the Department of Energy. COMAT has focussed on the coordination and Federal policy aspects of strategic nonfuel minerals as its first area of concern. The Committee has already met twice to assimilate background information and has asked the various Federal Departments to define areas of Departmental concern.

With respect to H.R. 2743 and the Senate Draft, we believe that legislative initiatives are premature. There is sufficient authority in place and substantial effort underway to address the concerns expressed in the bill. These should be given a chance to work before we direct our attention to the need for this legislation.

Mr. Chairman, we appreciate the concern and efforts of the Subcommittee on Energy Resources and Materials Production to develop national policies for dealing with the entire materials cycle. We look forward to working with you and your staff toward attainment of our common goal.

APPENDIX

MATERIALS RELATED ACTIVITIES OF THE NATIONAL BUREAU OF STANDARDS

U.S. DEPARTMENT OF COMMERCE

At the National Bureau of Standards, most materials related activities are centered in three areas: the Center for Materials Science; the Office of Recycled Materials; and the Office of Standard Reference Data.

CENTER FOR MATERIALS SCIENCE

The Center for Materials Science provides a foundation for U.S. industry in developing new products, increasing productivity and assuring future economic competitiveness. The Center's materials research program addresses major phases of the materials cycle, from processing through design, manufacturing, and assembly, to use and finally to recycling or discarding. The Center's programs cover three major aspects of materials science: transformation, structure/property, and durability. Transformation science is the basic science which underlies materials processing research, for it deals with the changes in state or microstructure of materials. It seeks to predict the microstructure which results from variables of composition, temperature gradients, pressure, and mechanical stress. Those same variables are of importance in industrial processing. Structure/property science addresses how to measure microstructure of materials and how chemical and physical properties depend upon microstructure. Durability science deals with the changes which cause deterioration in service, such as corrosion, wear, and fracture.

Center activities are formulated partly on the basis of recognized materials trends and problems, such as those identified by the National Academy of Science. The Center's scientists find it especially effective, however, to plan their efforts through direct contact with the users of their services, frequently by working in cooperation with their many "clients" in industry and government. Thus, the Center's assessment of the needs for materials standards is aided by having members of its staff participate in more than 120 engineering standards committees which are concerned with measurements needed for effective use of materials. The Center is helped both in program design and execution by 22 industry-supported Research Associates who work with its staff. In addition, the Center has attracted 54 guest workers from industry and universities. It also works closely with other government agencies. In fact, the Center currently provides technical assistance to approximately 60 different organizations within the Federal Government. About 40 percent of the NBS materials program is carried out to provide direct support to other government agencies. In addition, it sponsors or co-sponsors national or international conferences, symposia, and workshops.

To meet the needs of the metals processing and manufacturing industries for data required to develop durable, high performance alloys, the Center carries out theoretical, experimental, and data-analysis activities on alloy phase stability. The needs for accurate phase diagram information on new alloy systems have been addressed frequently in recent years, and a joint effort with the American Society of Metals (ASM) on phase diagrams is now underway. In this task, the ASM will serve as a direct interface with the metals industry so that needs and priorities can be properly determined. An international council involving 70 members from nine countries will advise on this effort. Two significant features of this joint effort are the

publication of a new bulletin for rapid information transfer and for making available to industry evaluated data directly from ASM.

In the area of engineering materials, a recent analysis at NBS identified seven innovative materials for which an improved materials science base would probably hasten their widespread adoption by industry. Among the most promising of these were: (1) the use of lightweight composites in structural applications, (2) the blending of known polymers to produce new "polymer alloys" with new and superior properties, (3) the deliberate orientation of polymer molecules into complex shapes with controlled structure to yield higher strength, (4) the use of industrial by-products such as silicates from smelting and refining to produce glass ceramics, (5) the rapid solidification of alloys to produce materials with improved strength and corrosion resistance, (6) the production of net or near net shapes from alloys in a partially solid-partially liquid state through processes which could revolutionize forging, extrusion, and casting, and (7) the formation of dual phase steels of greater strength and lighter weight in service.

One unique feature of NBS' structure/property science work is the 10-megawatt research reactor located at its Gaithersburg site. The low energy thermal neutrons emitted by the reactor are used in the structural analysis of complex and sophisticated materials. Researchers involved in such analyses come from a variety of government agencies, universities, and industrial organizations. Working with NBS staff, these investigators have studied many materials and materials transformations--among them cements, magnetic materials, and battery materials. Most recently, they have carried out fundamental studies of the chemistry of ceramics by neutron diffraction profile analysis, which promises to be a powerful new tool for studying crystal structure. NBS is also now constructing a special facility at the

reactor for small angle neutron scattering, to be used, for example, in the study of polymer structures. Next year, NBS staff will begin development of an additional facility at the Brookhaven Laboratory for the application of synchrotron radiation to materials. This application is expected to be the next generation of x-ray techniques for structural studies of crystalline materials. Similarly, NBS is broadening its research on the structure of noncrystalline materials critical to the production of reflective and anti-reflective optical coatings for high power lasers.

The anticipated durability of materials and products in service is a central consideration in their selection and use. Several years ago, at the request of the Senate Committee on Appropriations, NBS studied the national costs of corrosion. In October 1978, NBS assisted Mr. Stevenson's Subcommittee on Science, Technology and Space in the organization of the Legislative Conference on Governmental Policies for Corrosion Control. A major aspect of NBS' scientific program concerns corrosion abatement, as well as other aspects of materials durability including: wear, which is the primary cause of materials degradation in operating machinery; fracture, which is the cause of catastrophic failure of structural components; and the migration of plastic stabilizers, which is one of the principal causes of failure in plastics.

One example of NBS' research in measurement and corrosion science is the study of localized corrosion, wherein a metal is attacked at specific sites instead of being dissolved generally. These localized attacks lead to pitting, stress corrosion, and crevice corrosion; and failure can result even when most of the metal is relatively unattacked. In fact, localized corrosion accounts for the majority of corrosion failures. Moreover, this form of corrosion is the most difficult to detect, since the total amount of metal dissolved prior to failure may be small. NBS considers localized corrosion to

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be a major technical challenge and it is working on several approaches to help with understanding and controlling it. In particular, NBS materials scientists are developing measurement methods to determine the susceptibility of a variety of metals to localized corrosion. This information is essential for developing standard methods of assessing the suitability of a metal for service in a given environment and for development of new, corrosion-resistant alloys.

Another aspect, and a very important aspect, of materials durability is fracture control. At the request of the House Committee on Science and Technology, the NBS Center for Materials Science is now carrying out a study on the national costs of fracture. Improved fracture control methodologies depend upon predictive models. In fact, predictive models, coupled with nondestructive evaluation techniques, are becoming increasingly important in developing materials performance codes and standards.

OFFICE OF RECYCLED MATERIALS

The Office of Recycled Materials conducts the Resource Recovery Program and the Recycled Oil Program at NBS. Sections 5002 and 6002 of the Solid Waste Disposal Act (SWDA) as amended by the Resource Conservation and Recovery Act of 1976 (RCRA) mandate NBS actions concerning guidelines for specifications for recovered materials and governmental procurement of recycled goods.

The efforts of the Resource Recovery Program in the Office of Recycled Materials fall into three main categories. The first deals with direct laboratory based research aimed at achieving the goals of RCRA.

These activities include:

- Physical and Chemical Properties of Refuse Derived Fuel: this project is concerned with assisting in the development of data for use in specifying

and testing refuse derived fuels; research on test methods for the heating value, moisture, ash, and other properties of refused derived fuel (RDF); initiation of a sampling program to address the variability of RDF and its processing variables. This research will assist in developing general criteria for making RDF an article of commerce.

- Corrosion in Materials Used in Waste-to-Energy Systems: this recently initiated project will investigate the corrosion propensity of various materials in the harsh environment of waste-to-energy systems. The project will attempt to examine the mechanism of corrosion as it relates to waste mix, firing conditions, operation and maintenance, and material selection. From these data an attempt will be made to develop a method for accelerated testing of candidate materials being considered for waste-to-energy systems.
- Fossil Fuel Technology Waste Sampling and Characterization Program: this project is designed to assist DOE to develop a definitive and authoritative body of data on the physical and chemical properties of fossil technology residues from a variety of combustion and conversion systems. The data and test methods developed will assist DOE in the development of technically and economically acceptable environmental management of waste streams from coal combustion and fossil energy conversion systems. Tasks will include overall statistical analysis of the data, development of test methods sample collection and preparation, organic, and inorganic analyses, x-ray analytical techniques, and the preparation of quality assurance reference materials.
- Research on Recovered Glass: this project explores the properties of recovered glass and its effects in glass production.

- Fly Ash and Cements--Barriers to its Use: this program is aimed at examining specifications, standards, and test methods, and identifying barriers to the use of fly ash in cement, concrete, and cement block. This study will assist in carrying out the mandate of Sec. 6002 in procuring products containing the highest percentage of recovered material practical and possible provision of an expanded market for the increased use of ash in construction.
- Reference Materials: this project will assist the EPA in developing reference materials for a laboratory certification program. This project includes the preparation of quality assurance fly ash samples, determination of the extraction and analysis variabilities of leachate derived from the quality assurance samples of fly ash, examination of certain sludges for priority inorganics and selected organics, commencement of research in homogeneity, stability, sampling, and packaging techniques in order to develop quality assurance sludge samples for laboratory calibration.
- Liner Materials for Municipal and Hazardous Waste Containment: this project will review the reports of ongoing work at EPA on hazardous waste liner research. NBS will review other pertinent literature and develop a draft work plan for discussion with EPA. The areas to be considered include: permeation of hazardous waste materials through plastic liners; adverse effect of hazardous materials on plastic liners; chemical degradation of plastic liner materials; mechanical durability of plastic liner materials.

The second main area for Resource Recovery deals with Federal and State level procurement of products containing recovered materials. This program, in cooperation with ten states--Washington, California, Colorado, Minnesota, Illinois, Florida, Maryland, New York, New Jersey, and Michigan--will identify the technical barriers to the procurement of products containing recovered

materials. The project will examine State statutes and policies regarding such procurements, identify successful or unsuccessful procurement experience, identify potential products, and examine purchasing specifications for exclusionary citations, test methods, or performance criteria on the use of recovered materials.

The cooperating States have agreed to: survey and report on State statutes pertaining to the procurement of products containing recovered materials; report on past, current, or future programs and other State activities related to the procurement of products containing recovered materials; identify and report any legal, institutional, procedural, economic, or technical barriers to the State procurement of products with recovered materials; identify and report on any successful or unsuccessful attempts to procure products with recovered materials; provide a listing of the State's top ten products purchased based on volume and/or dollar value; provide a listing, based on the best knowledge and experience in the State, of products that are most amenable to the inclusion of recovered materials.

The Resource Recovery Program will also be carrying out a project dealing with the measurement needs necessary to implement waste management regulations, resource conservation, material recovery, and recycling. The project will focus on, but is not limited to, the programs under subtitles C and D of the SWDA, as well as other aspects of the law such as Subtitle E Sec. 5002 on specification of recovered materials and Subtitle F Section 6002 on the procurement of products containing recovered materials. The project will also include, where applicable and appropriate, those State and Local laws, regulations, and policies that support or enhance the RCRA related activities.

The project will also collect information on, and develop project techniques for, assessing the economic implications of unmet measurement needs at the State and Local levels.

The Office of Recycled Materials also conducts the NBS Recycled Oil Program.

The Energy Policy and Conservation Act (EPCA, P.L. 94-163; 42 U.S.C. 6201 et seq.,) was the primary force in establishing the Recycled Oil Program at NBS. Section 383 (c) of this law requires the National Bureau of Standards to "...develop test procedures for the determination of substantial equivalency of re-refined or otherwise processed used oil or blend of oil... with new oil for a particular end use." It also requires that after development of these test procedures they be reported to the Federal Trade Commission (FTC). The stated purposes of this legislation were to encourage the recycling of used oil; to promote the use of recycled oil; to reduce the consumption of new oil; and to reduce the environmental hazards associated with disposal of used oils.

The Resource Conservation and Recovery Act (P.L. 94-580, 42 U.S.C. 3251), in Section 6002, states that each Federal agency shall procure items with the highest percentage of recovered materials practicable. It further states that any decision not to procure such recycled material must be based on one or more of the following: unavailability; unreasonable price; or failure to meet NBS performance standards (when available). This Act includes recycled oils as well as other recycled materials. In addition, this law requires that exclusionary clauses in Federal and Military specifications be reviewed by the appropriate Federal agency, and revised to accommodate the use of recycled materials.

In addition, a model "State Used Oil Recycling Act" was sponsored by the Federal Energy Administration in 1976 and published in the Federal Register.

This model Act was designed to assist individual states in establishing control over used oil disposal, and clearly encourages recycling as a superior method of disposal. This model Act refers directly to Section 383 of EPCA for the determination of substantial equivalency for recycled petroleum products. Used Oil Recycling Acts, at present, have been passed by at least four States--California, Maryland, Arizona, and Utah. In most cases these laws are essentially identical to the model Act. Several additional states have also introduced legislation based on this model Act.

Recycled oil can be defined as "useful petroleum products extracted from used oils." Used petroleum oils which can be recycled for reuse can be obtained from many sources including automotive garages and service stations, taxi and truck fleets, military installations, industrial manufacturing facilities of all types, and waste-water treatment plants. Such used oils usually contain residual additives (both inorganic and organic compounds) and contaminants. Typical contaminants include water, dirt, wear metals, volatile liquid fuel, and inorganic and organic compounds (particularly oxygenated compounds). If not removed during the re-refining process, these impurities and contaminants can cause both performance-related and environment-related problems.

At the present time, about 1.2 billion gallons of collectable used oil are generated annually in the United States. This is approximately one-half of the total lubricating oil sold in the United States. A recent major oil company publication estimated that of the used oil which is collected each year, about 7 percent is re-refined into motor oils, 17 percent is reclaimed into industrial oils, approximately 50 percent burned for fuel or used in road oiling or dust control (often with little processing to remove contaminants), with the remaining 25 percent (approximately 300 million gallons) unaccounted for.

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There are a relatively small number of oil recyclers in the United States, with estimates ranging between 30 to 50. Also, the individual companies involved in oil recycling are small, averaging only 10 to 15 employees according to a recent Environmental Protection Agency report. Typically, these recyclers fall into three categories: processors (who process used oil for reuse as a fuel); reclaimers (who apply a variety of simple chemical and/or physical processes to the used oil for reuse as an industrial or hydraulic oil); and re-refiners (who employ a variety of technologies, generally with acid/clay or distillation/finishing treatment to remove essentially all of the impurities and contaminants, yielding lubricating base oils). In many cases an oil recycler is involved with more than one of these categories, and at times with all three.

One reason why recycled lubricating oil products have not met with widespread consumer acceptance at the present time, both by the Federal Government as well as by the public, is the lack of reliable test procedures and standards on which realistic performance criteria can be based. In the aforementioned legislation, NBS is directed to develop such test procedures and standards, and these procedures will provide the basis for FTC trade regulation rules for industry-wide performance standards and labeling requirements for recycled oil.

The first objective of the NBS program is to establish the scientific and technical basis for characterization of recycled petroleum products, including the research required to effectively utilize recycled lubricating oils. At the present time, there is a concern among user industries, especially the automotive industry, that the quality and batch-to-batch variability of recycled oils are not sufficiently well known to assure a continuous supply of high quality recycled oil. In addition, the various impurities and contaminants

which can occur in a used or recycled petroleum product may have effects on the final product which are not well established. A sound scientific and technical data base is crucial for the test procedures developed by NBS to be widely accepted by industry. This basic understanding has not been developed at present.

The second objective is to develop and evaluate test procedures establishing the substantial equivalency between recycled and virgin petroleum products.

This requirement is complicated by the current testing methods used. These current tests (called "engine sequence tests") consist of automobile/truck engines and/or special test engines on laboratory dynamometer test stands, and are run in sequence with different loads, speeds, temperatures, controlled blow-by (gases by-passing the piston rings), etc., usually requiring special gasolines. The controlled variables must be within prescribed limits for acceptable test results to be reported. For the API SE classification (i.e., the oil quality currently necessary to maintain automobile warranties) four engine tests are required. For the military specifications for administrative vehicles (MIL-L-46152, approximately equivalent to API SE/CC), five engine sequence tests are needed. The minimum cost of a set of these tests for a single oil is more than $15,000. Since there is no alternative set of commonly accepted test procedures or specifications for physical and chemical laboratory tests on oil basestocks or formulated oils, the small re-refining companies have had a difficult time entering the quality lubricating oil market.

The third objective is to provide technical information and support for the effective utilization of recycled petroleum products, and is important in accommodating recycled products for each end use. This objective includes providing technical support to the FTC as required for the NBS test procedures,

as well as, to disseminate th NBS research and evaluation results and other technical information on used and recycled petroleum products to the industry and the consumer public. Both the EPCA and RCRA legislation contain sections which emphasize the necessity for Federal agencies to encourage the utilization of recycled products, and to educate the public in the proper reuse and disposal of these products.

STANDARD REFERENCE DATA

Finally, in response to P.L. 90-396, the Standard Reference Data (SRD) Act of 1968, the National Bureau of Standards through the Office of Standard Reference Data evaluates and disseminates scientific and engineering data from the world's scientific literature. Twenty-two specialized data centers collect, compile, critically evaluate, and disseminate data in user-oriented formats in four major areas: Materials Durability and Resource Recovery, Process Design, Energy Applications, and Environment and Health. University and industrial scientists and engineers throughout the United States participate and assist NBS in these critical evaluations which provide many thousands of users with needed data on the processing, properties, and durability of alloys. Close interaction among the data centers, representatives of the user community, and the NBS Office of Standard Reference Data insures that users' priorities are reflected in all SRD programs. To disseminate the evaluated data, the Journal of Physical and Chemical Reference Data, which is published jointly by the American Institute of Physics and the American Chemical Society, was established in 1971.

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Productivity, Technology, and Innovation
Washington, D.C. 20230
(202) 377-3111

OCT 1 1980

Honorable Wendell H. Ford
Chairman, Subcommittee on Energy
Resources and Materials Production
Committee on Energy and Natural Resources
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

As you requested during your July 29 hearing on H.R. 2743, I am enclosing answers to the written questions included in your letter to Secretary Klutznick inviting Departmental testimony.

If I can provide any further information in this regard, I may be reached on 377-3966, or you may contact Esther Cassidy, Congressional Affairs Officer at the National Bureau of Standards, on 921-2441.

Sincerely,

/s/

Francis W. Wolek
Deputy Assistant Secretary

Enclosure

QUESTIONS

QUESTION 1

Please describe Federal financial assistance, transportation rate-making and tax policies for recycled versus virgin sources of materials.

ANSWER:

Policies for Federal financial assistance, transportation rate-making and taxation with respect to recycled versus virgin sources of materials are set forth in a wide variety of statutes including the Railroad Reorganization Act of 1976, the Solid Waste Disposal Act, the Energy Security Act, and the Energy Policy and Conservation Act.

With respect to Federal financial assistance for recycled versus virgin sources of materials:

(1) Certain financial incentives such as loan guarantees and price support loans for waste-to-energy conversion are provided by the Energy Security Act (Subtitle B). The Department of Energy (DOE) is currently preparing rules to implement these authorities.

(2) The President's Urban Grant Program is currently providing aid to 68 localities seeking to provide for solid waste management strategies including resource recovery.

(3) Subtitle F of Solid Waste Disposal Act requires governmental entities utilizing Federal funds to procure the maximum amount of recyclables as a market incentive for recycled commodities.

(4) The Economic Development Administration has made limited investments in the area of recycling, e.g., Baltimore, Maryland, as part of its regular program.

With respect to transportation rate-making, the Interstate Commerce Commission under law is charged with the responsibility for assuring that freight rates for recycled and virgin commodities are equal.

Tax policies for recycled vs. virgin materials are laid down in a variety of statutes. The Treasury Department implements these policies. For example, a total of a twenty percent investment tax credit is available for equipment used to recycle and market discards originally destined for waste, while only a ten percent credit is available to those who rely only on virgin material sources. On the other hand, depletion allowances (minus local severance taxes) are available to producers of many virgin goods. This area is extremely complex, and further questions concerning the details of tax policies and their impacts should be directed to officials of the Treasury Department.

With respect to overall policy, the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (RCRA) created a Cabinet level committee, the Resource Conservation Committee, consisting of the Administrator of the Environmental Protection Agency (EPA) as Chairman, the Secretary of Commerce, the Secretary of Labor, the Chairman of the Council on Environmental Quality, the Secretary of the Treasury, the Secretary of the Interior, and a representative of the Office of Management and Budget, which was charged with conducting

"a full and complete investigation and study of all aspects of the economic, social, and environmental consequences of resource conservation with respect to—

"(A) the appropriateness of recommended incentives and disincentives to foster resource conservation;

"(B) the effect of existing public policies (including subsidies and economic incentives and disincentives, percentage depletion allowances, capital gains treatment and other tax incentives and disincentives) upon resource conservation, and the likely effect of the modification or elimination of such incentives and disincentives upon resource conservation;

"(C) the appropriateness and feasibility of restricting the manufacture or use of categories of consumer products as a resource conservation strategy;

"(D) the appropriateness and feasibility of employing as a resource conservation strategy the imposition of solid waste management charges on consumer products, which charges would reflect the costs of solid waste management services, litter pickup, the value of recoverable components of such product, final disposal, and any social value associated with the nonrecycling or uncontrolled disposal of such product; and

"(E) the need for further research, development, and demonstration in the area of resource conservation."

The report of this Committee was submitted to the President and the Congress in 1979. In addition, the Congressional Office of Technology Assessment in a report to the Congress entitled "Materials and Energy from Municipal Waste," (two volumes) issued July 1979, dealt in detail with each of these issues.

In addition, Subtitle E of the Solid Waste Disposal Act as amended by RCRA directs the Secretary of Commerce to identify markets for materials recovered from discards destined for disposal, identify economic and technical barriers to the use of such materials, and to encourage expanded and new uses for recovered materials. This mandate covers many forms of waste including industrial and commercial waste, municipal waste, and hazardous (other than nuclear) wastes. In addition, the Secretary must utilize the National Bureau of Standards (NBS) to develop guidelines for specifications for materials recovered from waste destined for disposal.

QUESTION 2

Please describe the Department of Commerce's research and development program for nonfuel minerals. How much money was spent by the Department on this function in FY 1980? How does this compare with research and development done by other agencies?

ANSWER:

The Department's FY 1980 research and development budget for non-fuel minerals is approximately $26 million. The majority of our Departmental research and development activities in support of materials substitution, recycling, use, and related production technologies are conducted at the National Bureau of Standards. These activities provide for more efficient use of materials, as well as support processing, manufacturing, and recycling of alternative materials. As you may be aware, NBS, since its formation in 1901, has been intensively involved with materials research and development. The basis for this long-term involvement in materials is found in Section 2 of the Bureau's Organic Act (15 U.S.C. 272), where Congress has assigned to NBS specific responsibilities for the analysis and characterization of materials, for ways of specifying and testing materials, and for the evaluation and tabulation of the physical and chemical properties of scientifically and industrially important materials. These activities constitute an essential infrastructure to science and technology, and they are an essential part of the NBS mission.

For FY 1981 the President's budget requests $5.2 million for the establishment of cooperative generic technology centers by the Department of Commerce. These centers will undertake R&D in key industrial areas which we expect may include such materials-related tasks as corrosion prevention and improved metallurgy technologies. These centers are part of the President's plan to increase innovation and productivity.

In recent years Congress has assigned the Department of Commerce new responsibilities in the recycling and substitution field. In 1975, section 383(c) of the Energy Policy and Conservation Act (42 U.S.C. 6363(c)) assigned NBS responsibility for developing test procedures for determining the substantial equivalency, relative to new oil, of rerefined oil. The lack of such generally accepted test procedures severely limits the use of recycled oil products, and contributes to the dumping and waste of millions of gallons of used oil each year. In November 1978, NBS completed the first phase of this work; we provided the Federal Trade Commission with test procedures related to the use of recycled oil for burner fuel. Now NBS is developing tests needed to assure the equality of recycled oil for use in engine lubrication, industrial applications, and so on. Further, amendments made to the Solid Waste Disposal Act (SWDA) by the Resource Conservation and Recovery Act (RCRA) of 1976 (Public Law 94-580) also assigned DOC new responsibilities. As a result of these new assignments NBS has a program to develop guidelines for use in classifying materials recovered from waste. This is an extremely important step in the effort both to reduce the economic and environmental costs of disposal, and to conserve by recycling valuable materials resources that would otherwise be lost.

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With regard to materials research and development in other Federal agencies, in 1978, the Committee on Materials (COMAT) conducted a study on materials R&D in the public sector. The study estimated that approximately $1 billion is expended annually by about 18 different Federal agencies. The study also contains the latest breakdown of Federal expenditures, which is for FY 1976, on materials R&D by agency which was estimated as follows: DOE - 37%; Department of Defense - 20%; National Science Foundation - 14%; Department of the Interior - 10%; National Aeronautics and Space Administration - 7%; EPA - 5%; Department of Commerce - 3%; (with the remainder divided among the other agencies). The Department of Interior has the major responsibility for non-fuel minerals research.

QUESTION 3

What mechanism exists for the coordination of nonfuel mineral research and development between the various Federal agencies?

ANSWER:

In early 1980, Dr. Frank Press, Director of the Office of Science and Technology Policy, established the Committee on Materials (COMAT) as a Subcommittee of the Federal Coordinating Council on Science, Engineering, and Technology. This Committee has been established at the Assistant Secretary level and is chaired by Dr. Edward Frieman, Director of the Office of Energy Research of the Department of Energy. COMAT has focussed on the coordination and Federal policy aspects of strategic nonfuel minerals as its first area of concern. The Committee has already met twice to assimilate background information and has asked the various Federal Departments to define areas of Departmental concern.

QUESTION 4

What agencies of the Federal government have the most expertise on the following:

- minerals recycling and substitution R&D
- mineral production and distribution data
- exploration, recovery and mining technologies
- need for trained minerals manpower
- the role of public lands in our materials supply picture
- how mineral export/import policy relates to national materials needs

ANSWER:

Over 20 different Federal departments and agencies have responsibilities in the area of materials. The following agencies have major, but not necessarily the "most", expertise in materials within the Federal government. As I pointed out in my written testimony, the Department of Commerce, through the National Bureau of Standards (NBS), conducts programs in non-fuel minerals recycling and substitution research and development. The research and development programs at the NBS contribute to the more efficient use of materials, as well as to support of the processing, manufacturing, recycling and substitution of materials. The Department of the Interior (DOI), through the Bureau of Mines (BOM), the Department of Defense (DOD), the Department of Energy

(DOE) and the EPA also have expertise in minerals recycling and substitution research and development.

The BOM, the DOC through the Bureau of Census and the Bureau of Industrial Economics, the Central Intelligence Agency, and the DOD have major programs and responsibilities in mineral production and in the distribution of mineral data. The BOM collects and issues the majority of mineral data.

The BOM and the U.S. Geological Survey of the DOI, have the most expertise in exploration, recovery and mining technologies of minerals.

With regard to expertise in the need for trained minerals manpower, the Mining Safety and Health Administration of the Department of Labor has programs in safety and training of mining personnel and the BOM performs research on equipment and techniques to improve miner health and safety. The DOI also funds the mineral institutes which provide assistance to universities for training mineral engineers, geologists, and mineral economists.

With regard to materials manpower, the DOC has one of the major Federal laboratories outside of the DOE national laboratory system in materials science in the nation and draws its staff from a wide variety of schools of materials science associated with major colleges and universities as well as their departments of physics and chemistry.

Agencies that have expertise related to the role of public lands in materials policy include the Forest Service of the Department of Agriculture, and the Bureau of Land Management and the National Park Service of the DOI (agencies which lease minerals on public lands under their management); the BOM and the U.S. Geological Survey of the DOI (agencies which evaluate the mineral potential for public lands); and the Bureau of Industrial Economics and the Office of the Assistant Secretary for Policy in DOC (organizations that have policy analysis expertise related to the role of public lands in our materials supply picture).

The International Trade Administration and the Office of Industrial Mobilization of the DOC, the BOM of the DOI, and the Department of State have major Federal expertise in how mineral export/import policy relates to national materials needs.

Senator FORD. The next witness is Dr. William Vogely, Department of Mineral Economics, Pennsylvania State University, University Park, Pa.

STATEMENT OF DR. WILLIAM A. VOGELY, PROFESSOR OF MINERAL ECONOMICS, DEPARTMENT OF MINERAL ECONOMICS, PENNSYLVANIA STATE UNIVERSITY, UNIVERSITY PARK, PA.

Dr. VOGELY. Good morning, Senator. I would like to read my statement and add comments as I go along.

Senator FORD. That's fine, Doctor, you may proceed.

Dr. VOGELY. Thank you.

Mr. Chairman, I am William A. Vogely, professor of mineral economics at Pennsylvania State University. Prior to going to Penn State, I was a senior civil servant with the U.S. Bureau of Mines and the Department of the Interior for over 20 years dealing with mineral and materials issues. I am pleased to testify today on H.R. 2743, focusing on the staff working draft dated June 16, 1980, which is the draft out of the Commerce Committee reported to you.

Materials policy has been a matter of recurrent concern since World War II. This concern has resulted in over 30 major studies, averaging 1 a year, by responsible Government organizations and major nonprofit private groups.

Included in these studies are those of three formal Presidential or congressional commissions, at least two major administration studies and many agency reports. Yet other than the Mining and Minerals Policy Act of 1970, no comprehensive legislative statement concerning materials policy has emerged.

Although there can be much disagreement as to why this is so, the fact that the advocates for a materials policy enunciated by the Congress have not made a persuasive case is undisputed.

H.R. 2743 addresses the issue and enunciates a declaration of policy. The findings, however, while true, do not indicate that there is now or in the future real cost involved from materials issue to the United States. Just to make the point, in those findings you could replace capital or even food with minor word changes and the findings would still be true.

I believe that unless a case can be made that the United States is facing a real cost or a real damage now or in the future, support for H.R. 2743 is difficult to justify. The declaration of policy in this bill states what is now stated as the objective for various executive agencies of the Government.

Very similar statements appear in the annual reports of the Bureau of Mines, for example. It is very similar to the statement in the 1970 act referred to above with the substitution of materials for minerals.

The specific actions called for by the President in this legislation do touch on several points which need additional action. Paragraph 1 places the Secretary of Commerce in the key position. Perhaps the lack of a definition of materials in the legislation is relevant.

Materials are usually defined broadly to include every substance used by society except food, energy fuels, and drugs. With this definition, it is clear that many existing organizations in the Government now exercise initial responsibility and have the expertise about certain materials; the Department of the Interior for miner-

als and some timber; the Department of Agriculture for timber and animal and vegetable fibers; the Department of Commerce for chemical processing; the Department of Energy for plastic and synthetic textile raw materials; and the Department of Defense, Commerce, Interior, and Agriculture for R. & D. on various materials. Perhaps it would be better to leave the designation of the action agency out of paragraph 1.

Paragraphs 2 and 3 do identify areas of substantial problems. Each of the major commissions reporting in the last 8 years has clearly demonstrated the need for better coordination and especially for better assessment capability by the Federal Government on materials problems.

Paragraphs 4 and 5 which relate to R. & D. do not make a finding that energy is sufficient but suffers from a market failure that makes basic research less than optimal.

Paragraph 6 parallels the 1970 act statement but it is without content unless it is more specifically stated.

The action forcing provisions are for a 3-month report on need, followed by a 1-year report and continuous reports thereafter. Also, the President is directed to present a program plan within 1 year.

I confidently predict that if H.R. 2743 is enacted in this form, it will achieve no results. The experience with the 1970 act, very similar in content and very similar in structure, does not make me optimistic. The 1970 act called for the Secretary of the Interior to present an annual report to the Congress on the state of the minerals industry, not materials, but minerals industry.

He was supposed to recommend to the Congress the emerging problems and actions that should be taken legislatively to solve those problems. This act has been completely ineffective. There have been eight reports submitted, but these reports have never been acknowledged by the Congress nor by the President nor the White House.

The reasons for the failure are, I think, quite fundamental and those reasons are existent in this bill. In the first place, given the Executive orders that govern Cabinet and govern the operation of all administrations, at least in my experience, it is impossible for a Cabinet officer to make an independent recommendation for legislation to the Congress.

All recommendations for legislation to the Congress must be processed through the Executive Office of the President, must be cleared through the legislative part of OMB and cannot come forward to the Congress without that kind of clearance.

Therefore, to direct a Cabinet officer to make independent recommendations is futile.

Second, as I have pointed out, materials and minerals as far as that may be cover the expertise and missions of many executive departments. To place responsibility in a single executive department will insure that proper coordination does not take place and that you do not get the kind of coordination that is required.

Finally, the major failing, a third major reason that this approach does not work is that there is no recipient on the Hill for the report. The report simply is submitted to the Speaker of the House and the President of the Senate and it lies on the table.

This process works in two cases. It works in economics because you have a joint committee on the economic report of the President which receives the report and analyzes it and translates it into congressional action and you have the Joint Atomic Energy Commission who used to do the same thing.

So if you are going to set up a process, such as Congressman Fuqua called for, you have to do two things. One, you have to have the responsibility high enough in the executive branch so that coordination can be properly done and second, you have to have a recipient committee or committees or a joint committee on the Hill who have the charge to handle that report when it is presented.

The second major need which I think is there and it has been clearly demonstrated is the need for betting information and a better analysis system for materials. The Paley Commission in 1952 called for such a need and some action was taken.

The National Commission on Supplies and Shortages which reported in 1976 made a very strong case for such a need and even the nonfuels mineral policy study of last fall issued by this administration makes the inadequacy of the data and analysis system a major policy issue.

The Congress could address this issue by directing the President to establish an independent agency, patterned after the Bureau of Labor Statistics, for material information and analysis. I propose the BLS as a model because of the relative failure of the Energy Information Administration to live up to our hopes, due in part to the lack of independence of the director. Since this organization for materials must contain a strong analytic capability, BLS is a better model than the Bureau of the Census.

Another identified failure in the materials field, especially minerals, is the fact that the minerals have not been represented in Government councils by an objective advocate, a disinterested advocate. Every Government agency, pursuing its legally prescribed mission, has advocated actions that have materials implications but it has been left to the private sector of producers to advocate and lobby for modifications to alleviate adverse impacts on the materials sector.

I point, for example, to the Hazardous Substance Act of EPA, the regulations dealing with asbestos for health reasons, the safety legislation, all of which have major impacts on materials availability. But nowhere in the process is this material implications handled on an objective basis.

Many proposals have been made to solve this problem. The main one that has been around for at least a decade is the establishment of a Department of Natural Resources. Perhaps a much less comprehensive approach of a permanent Council of Material Availability within the Executive Office of the President should be considered with the charge to report to a committee or joint committee on the Hill on an annual basis on problems in materials availability.

In summary, I believe that H.R. 2743 does not identify pressing needs to be addressed and would not be an effective instrument to handle identified needs in the materials field. I urge this committee address the two needs I have identified, those of coordination and advocacy and those of information and analysis, and deal with

them directly in legislation which would effectively achieve the desired ends.

Thank you, Mr. Chairman, I will be glad to answer any questions you may have.

Senator FORD. Thank you, Doctor, for your very forthright statement and analysis of the legislation. I do have several questions and I want to run through those with you from your past bureaucratic experience and now the real world, I guess——

Dr. VOGELY. I'm not sure a university is the real world.

Senator FORD. They play damn good football and that's the only real world I understand about Penn State. Dr. Oswald is president, isn't he, and he got an awfully good start at the University of Kentucky. [Laughter.]

Dr. VOGELY. That's true and for several years I was the chief adviser to Rogers Morton whose brother was a Kentucky Senator.

Senator FORD. Yes, sir, and he did a right good job. I am one of the few people who can pronounce his first name. It's Thruston and everyone wants to make it Thurston.

Now that we've gotten through the pleasantries, let's get on to the facts. You say "A materials policy enunciated by the Congress has not made a persuasive case is undisputed." Why have we not made a persuasive case?

Dr. VOGELY. One can disagree but I believe we have not made a persuasive case because we have not stated the true nature of the problem. Most of the cases that have been made have been based upon two elements. One, that minerals are indispensable. If you don't have cobalt, you can't build a plane.

The other, that import dependence raises an issue by itself which needs to be addressed. All elements of production are indispensable. You can't build a plane without people, you can't build a plane without capital equipment, you can't build a plane without a transportation system.

So there is nothing unique about minerals as being required for production. All elements of production functions are required for production. This element alone does not make a case.

Second, in import dependence, it is clear that society—it is our enunciated policy—society gains from relatively free trade and this has been the thrust of our trade policy since 1943. The case for import dependence raising a problem has to rest on something other than the fact that we are import dependent. It has to rest upon the impact of our political stability, on the fact that we can be held up for blackmail or whatever.

The third element, and this is what happened in the nonfuel mineral policy study which is still at the White House, is that it ends up with a commodity problem. It ends up with a well-enunciated problem of cobalt, it ends up with the well-enunciated problem of chromium.

The current context of that problem is that we are dependent upon one area of the world, that is southern Africa for platinum, chrome, cobalt, and this dependence is politically unacceptable because of the political situation in southern Africa.

The obvious answer to that, rather than an overall materials policy is the one we have taken historically and that is that if we

are dependent upon chrome and dependent upon cobalt, it is relatively cheap, a few million dollars, to stockpile a 5-year supply.

We have that. I can't give you the precise size of the cobalt stockpile, but I will wager it is at least a 5-year supply. I know the chromium stockpile supply is that large.

So every time the issue has been raised, the action has been taken on the specific commodity which was identified and therefore the pressure for an overall piece of legislation is relieved. I think there are very fundamental characteristics in the minerals industry, not timber, not fiber, but in the minerals industry that do require a congressional intention.

These have to do with the fact that minerals must be discovered before they can be produced. So you have here the whole problem of discovery from a resource endowment given by nature. This then raises major issues in Federal land policy, major issues in tax policy, major issues in other kinds of economic and environmental policies which have unique impacts on minerals.

I think the case has not been made, I think a case can be made.

Senator FORD. What is the proper perspective for us to be in here? Throughout your statement, you say that there is no imposing real cost, no imposing real damages to the economy or welfare of the country. Why should we be interested in these?

Dr. VOGELY. Because the potential is there.

Senator FORD. The potential is there?

Dr. VOGELY. That's right. It has been avoided historically. I happen to be a chairman of a committee of the National Academy of Sciences which is looking at this now. Some very important people who are members of that committee challenge me to give them an instance since World War II where materials availability has imposed real cost on the economy, materials availability, and there are none.

The potential is there and you need an assessment system and an information system and a coordination system which will give you leadtime on that potential. But you cannot make a case, like you can on oil, of the 1973 embargo which imposed tremendous costs on our society.

After all, as a matter of policy, we did not import chrome from our major supplier for a period of 10 years because we were backing up the U.N. action on Rhodesia and as far as I know there was no major cost to the society for so doing.

Senator FORD. In your statement, Doctor, you allude to paragraphs 2 and 3.

Dr. VOGELY. Yes, that's the committee draft. They call—paragraphs 2 and 3, one calls for a better information system and the other calls for the necessity to coordinate materials policy.

Senator FORD. You say in your statement that each of the major commissions reporting in the last 8 years has clearly demonstrated the need for better coordination and especially for a better assessment capability by the Federal Government.

Dr. VOGELY. Correct.

Senator FORD. Now, do you agree with that position?

Dr. VOGELY. Absolutely.

Senator FORD. How do we get into a better position of assessing the capability by the Federal Government on the reporting of the

substantial problems in the area? What do you see those two paragraphs doing for us? Apparently these are about the only two you agree with?

Dr. VOGELY. That's right. I also agree with R. & D. but in a different context.

Senator FORD. That gives you room to work it out.

Dr. VOGELY. With all due respect, I think you had an example of the coordination problem this morning in the testimony from the people from the Department of Commerce. That gentleman was here to testify and he could not answer the questions about iron ore and he could not answer the questions about cobalt.

He could not answer the questions because these are in the responsibility of the Department of the Interior and not the responsibility of the Department of Commerce. In the same way, had you had the Department of the Interior here to testify, he could not answer the questions on research and technology that you asked that witness.

It is clear, if you look at the mandate of the 1970 act which directed the Department of the Interior to come up with an integrated statement on the state of the materials industry—and I really think you must recognize that most people use materials and minerals interchangeably. The distinction is there but most people are talking about minerals when they talk about materials.

The annual report of the Secretary of the Interior is not coordinated with anyone, it does not have input from the Department of State, it does not have input from the Department of Commerce, it does not have any input from the other agencies dealing with the issues which impinge upon minerals.

The lack of coordination is there. The two commissions which I referred to is the commission under the chairmanship of Boyd which reported in 1973 and the Commission on Supplies and Shortages which was under the chairmanship of Don Rice which reported in December 1976.

Both of these major commissions made this finding and I agree with it wholeheartedly. Historically, the Department of Natural Resources has been the proposed answer, let's bring all the resources together in one department. That has been through very extensive congressional hearings and has not been adopted for probably good and sufficient reasons.

I am suggesting a much smaller study and that is to establish within the Executive Office of the President a council with responsibility for materials issues, that council to be legislatively established, to report annually to a recipient committee on the Hill.

Senator FORD. You say the inadequacy of the data analysis sytem is a major policy issue. That may be where we should be going.

Dr. VOGELY. That's right. You can go there without taking the coordinating step. There are virtually, I would guess every executive department has some impact on materials.

The existing information systems, the existing analytical capabilities outside of energy lie primarily in the Department of Commerce for industrial operations and in the Bureau of Mines for basic mineral resource information along with the U.S. Geological Survey in the Department of the Interior.

I believe that a single agency, independent of political control like the Bureau of Labor Statistics run by a set of commissioners who have fixed terms and which don't respond to political criteria but respond to professional criteria needs to be established so that the reports of that organization would be objective, would be believed, would be not subject to political control.

The initial proposal for the Office of Energy Administration was of that type. But in the final legislation, the office was placed under the Secretary and even though the bill says that the Director of the Office of Energy Information or Energy Information Administration is to report directly to the Congress, he is not able to so do.

Any report that comes up has to be cleared by the Secretary of Energy. I think you need independent objective analytical information.

Senator FORD. What you are saying would be very difficult to do as it relates to an independent agency, wouldn't it?

Dr. VOGELY. Yes, it will be difficult to do, but it's not impossible.

Senator FORD. I am talking about politically.

Dr. VOGELY. Sir, I was told a long time ago to stick to analysis and not try to tell politicians what is difficult and what is not difficult.

Senator FORD. What I mean is, it has been said that information is power and therefore each agency that now has an assignment that retains their bureaucratic corner, it is theirs. Whether you put the connotation of political decision on it or not, let's just say it was the Baptist Church.

It would be very difficult to get the classes together, wouldn't it, to make one coordinated men's class or something? That's the political connotation I am talking about. It might not be the best analysis to make.

Dr. VOGELY. You're absolutely right and probably that's the reason why the Department of Natural Resources continually ran up against opposition, on a turf basis. That's true here.

What you could do, however, as a relatively minor but still effective step would be to reestablish within the Department of the Interior a relatively independent information and analytical arm. The Bureau of Mines played this role for decades but it has been continually eroded since the mid-1960's in playing this role as the expert advisee.

The USGS for many years was considered the scientific organization but that, too, has eroded. If that could be reestablished, it would be a major step forward.

Senator FORD. Dr. Vogely, there have been several attempts in other areas to develop an agency similar to the BLS. It has been very difficult to do and has really failed in those attempts over a long period of time. What you are suggesting may be right, but the path will be very bumpy, I think.

Dr. VOGELY. Yes, that is correct. But unless you do have some kind of mechanism within this bill to force action, to force consideration of these issues, passage of the bill will be like the 1970 act, it may assuage the conscience of Congress that they did something, but nothing will happen.

Senator FORD. What you are saying is there is no independent voice now that has to be cleared through?

Dr. VOGELY. There is no objective voice.

Senator FORD. No objective voice. As we heard earlier, I can give you my personal opinion. Congress has to make the decision and we have to make the decision based on, regardless of what the arguments might be to bring it together.

Dr. VOGELY. There is another possibility, Senator Ford, and I put it forward in complete ignorance of your rules.

Senator FORD. Welcome to the crowd. [Laughter.]

Dr. VOGELY. That would be for Congress itself to establish an organization reporting to itself to provide objective analysis of these issues. You do have within your structure the Office of Technology Assessment and you have within your structure now the Congressional Budget Office and you have the Congressional Reference Service and the General Accounting Office, all of which provide advice directly to the Congress and not to the Executive.

It might be possible to establish or give as a charter to one of these organizations the responsibility of advising the Congress on this issue on a permanent continuing basis.

Senator FORD. Doctor, have you heard of legislative veto?

Dr. VOGELY. Yes.

Senator FORD. We have created so many independent agencies out there that now we have decided that we've got to put a cap on them so we let them run wild and then we put a legislative veto on so that after they run wild, we can stop them. But while they are running wild, there is no hold on them. I am not sure that I want to allow us to create another agency that would just report to us and if it's ours, we want to give it more money and more people and that sort of thing.

Dr. VOGELY. I think you are getting very fundamental, Senator Ford, and that it is this issue of sufficient overriding importance to the American people to do things which are difficult to do? If it isn't, then nothing will be done. If it is, then it deserves the harsh difficult path.

Senator FORD. We are not prone to making hard decisions, we give that to someone else. We create a group to make hard decisions.

My last question is a two-pronged question. I notice that your title is professor of mineral economics. Most major material studies, I think, of the last 30 years have emphasized the need to rely on the market for decisionmaking.

Do you think it is necessary to have the Government move into the marketplace at this point or can we look at the economics of it and at the same time look at the availability? You are talking about a 5 year supply of most of these strategic materials that are necessary to us and we have them so, therefore, we don't worry too much.

But it seems to me that if we keep stockpiling, at some point they will look at us and say, well, in 5 years, they will be able to cut us off, but we have a leadtime of 5 years so we relax and rest on our laurels. We wake up some morning and our laurels are crushed and we have a 5-year stockpile and nothing is eliminated.

So there is economics in supply, research, and development might be part of it, but somewhere along the way, how does economic supply to the potential supply?

Dr. VOGELY. You have opened up a very wide area and I will try to give you a quick answer. I believe in terms of production decisions, in terms of the allocation of resources to their highest use, et cetera, the market system, the price system works better than anything else.

However, I think there are perhaps major elements in the structure of the materials minerals industry that require attention at the policy level by society as a whole. These are, one, the fact that to get minerals, you have to be able to explore.

The Federal Government, like it or not, has the monopoly on most of the potential mineral lands in the United States, since they lie in the Federal domain. Therefore, what the Federal Government decides to do with these lands has major impacts on the minerals industry and the minerals industry ability to operate as a private enterprise system. That's one thing.

The second thing is that the structure of these markets has changed dramatically in the past 5 years. Only in the United States, perhaps in Japan, do the minerals industries operate as basically privately owned enterprises. We are asking the Kennecott's and the Alcoa's of this world to compete with nationalized firms or national firms in the rest of the world.

Whether or not free enterprise and nationalized industry can coexist is an unanswered question. I think there is an issue there that needs to be very carefully looked at. There are no answers now but it's clear that there is the potential for nationalized industries to destroy the ability of markets and private enterprise to operate.

Senator FORD. Lights came on. Is this the kind of question an independent agency could look at and begin to form a judgment?

Dr. VOGELY. Precisely. The last issue is also one they would need to look at. That is the fact that markets for minerals, if left alone, become extremely volatile. You have periodic cycles of shortage and periodic cycles of gluts. That is simply the way these markets operate if left alone.

There may be a very good case for Government establishment of rules dealing with markets such as the commodity exchanges, dealing with speculative activity which—look at the silver market in the past year. There is a major area there because of the inherent structure of these industries which may require Government action.

My essential testimony is that these cases have not been made, the cases have been made on other bases which simply is not very persuasive.

Senator FORD. Doctor, you have been a very informative witness and I have enjoyed having our colloquy. Hopefully in the future, we might look at your future today and see that you have made some sort of inroad in the proper direction.

It is very sensitive and it might be one we can take by trial and error. As you say, none of these questions have been answered and we are going to try to find out if they work. If they don't work, we'll have to do something else.

I don't want to get into a position of finding that they don't work and have to shift gears. I want to keep it on a smooth path. Thank you very much, Dr. Vogely.

Dr. VOGELY. Thank you, Senator.

Senator FORD. The next witness is David Seaver, Decision Science Consortium, Inc., Falls Church, Va. David.

STATEMENT OF DAVID A. SEAVER, DECISION SCIENCE CONSORTIUM, INC., FALLS CHURCH, VA., ACCOMPANIED BY DR. GARY HILL

Mr. SEAVER. Thank you. This is my colleague, Dr. Gary Hill. We would like to thank you for the opportunity to present our views this morning. If you don't mind, I think I will briefly read through the statement.

Senator FORD. Your statement will be included in the record.

Mr. SEAVER. OK. I think as background to what we have to say here, perhaps it's useful to say a little bit about who we are. Our area of expertise is basically in strategic planning and forecasting political risk assessment.

Before presenting our ideas on the national materials policy and the critical elements of such a policy, it might be useful to briefly describe a study we are completing to stipulate our interest and shape our views.

We have been investigating the role central and southern Africa can be expected to play in supplying four minerals—chromium, cobalt, manganese, and platinum group metals—to the United States over the next 20 years. Our study is not yet complete so we want to refrain here from drawing conclusions which further analysis may not support, but we do want to offer a few comments that I think are particularly relevant.

The degree of U.S. dependence on this area is dramatic. The United States does not produce chromium and approximately 38 percent of our chromite ore and 63 percent of our ferrochromium come from this area. We also produce no cobalt or manganese and this area is the source of about 70 percent of our cobalt, 50 percent of our manganese ore and 34 percent of our ferromanganese.

The United States imports over 90 percent of its platinum group metals consumption of which about 50 percent comes from southern Africa. While some argue that ocean mining of manganese nodules and technological advances in substitute materials research will greatly reduce our dependence, our study indicates that most experts do not foresee these developments significantly improving the U.S. position during the next 20 years.

I might add that with regard to stockpiling these minerals, for example, the cobalt stockpile is at approximately 50 percent of its stated goal and there are problems with increasing the stockpile. For example, we have a major supplier of cobalt who does not want to sell cobalt to the United States to go into the stockpile.

The chromium stockpile is basically chromite ore and the United States is currently losing its capacity rapidly to process this ore into ferrochromium. The stockpile is obviously not the answer to shortage problems.

The study has involved developing probabilistic forecasts of conditions in the supplying countries and the effects of these condi-

tions on the exports of the minerals. Supply disruptions are then linked to models that forecast potential economic costs to the United States should the disruption occur.

While the study is not yet complete, it does illustrate a not uncommon problem: the United States depends on potentially unstable foreign sources for most of its supply of these minerals.

We mention this study not only to illustrate potential supply problems, but also to point out that it—and other R. & D. efforts—embrace only parts of the total problem. And no matter how high quality such efforts are, unless there is a coherent approach overlaying and integrating the parts, a maximally effective solution may not be identified.

This integration is difficult because in part, of the many agencies and departments over which responsibility is scattered and the lack of a formal coordinating mechanism and a common framework for addressing the problem. This then is what the National Materials Policy Act can do: provide the needed mechanism for the development of a comprehensive approach to identify and implement appropriate procedures for meeting critical materials needs.

We would like to comment on what we regard as critical elements of the implementation of a national materials policy. First and foremost, it must deal with all aspects of the materials supply problem within a common framework from which the implications of decisions can be easily discerned. Attached is an exhibit which illustrates the generic framework that might be appropriate to this problem.

We must begin by identifying the potential supply shortages with a careful assessment of possible supply and demand patterns. On the supply side this will require consideration of possible new sources both domestic and foreign improved efficiency in production, recycling and the stability and reliability of foreign suppliers.

We emphasize the latter because often it may be the variable in supply over which the U.S. policy exerts the least control. We need a careful assessment of the current and future security of foreign supply sources.

On the demand side, policy development must consider potential new demand patterns, for example, as might be brought about by major new defense systems. The potential for substitution, improved efficiency in use and conservation must also be considered.

As the potential for shortages is identified, the impacts of such shortages must be considered. Impacts will be diverse, yet cannot be addressed independently. Economic impacts should be considered simultaneously with defense issues and foreign relations because tradeoffs may be involved and should be made clear.

Simple consideration of the economic aspects does not provide us with the total picture.

With this basic framework in place, we can begin an examination of the strategies the United States can adopt to reduce shortages and mitigate their impacts. Two types of strategies should be considered which we have labeled "reactive" and "proactive."

Reactive strategies are those which are adopted in response to an actual shortage. The development of contingency plans to implement reactive strategies can mitigate the effects of shortages. Such plans may include Government allocation, stockpile release, indus-

try substitution, foreign policy actions, et cetera. U.S. materials policy should include contingency plans based on their relative cost effectiveness.

Proactive strategies on the other hand are those adopted prior to a shortage to reduce the chances of its occurrence and reduce its impacts if it occurs. A wide range of proactive strategies exists and should be examined on a cost effective basis.

U.S. foreign policy can play a role in the stability of foreign supplies. Stockpiling can be, and is being, undertaken to meet short-term shortages. Early warning systems can be developed to provide advanced indication of impending shortages and thus increase our time to prepare responses.

Programs can be undertaken to stimulate recycling, domestic production and research and development to improve efficiency of production and use. These various strategies must be examined in terms of their effects on the chance of a shortage occurring, the effects of the shortage if it occurs and the cost of implementing the strategy.

In closing, we would like to emphasize two points on which we feel the effectiveness of a national materials policy will rest. First, all efforts related to the development of national materials policy should be undertaken within a comprehensive and common framework.

And second, an implication of this is that there should be a central location of responsibility with the authority to implement needed studies. Although these points cannot ensure an effective policy, without them there is little chance for improving existing practices.

Senator FORD. Let me ask a question or two. On page 2 in your last paragraph, you say that most experts do not foresee these developments. What experts?

Mr. SEAVER. We have as part of our study been talking with experts from Government, from industry, from academia and part of our study has been to get their viewpoints on these particular problems. We are not in a position at this point to reveal the names of those individuals, but they are people that are highly regarded and there is I think a consensus that under the current circumstances, ocean mining and technological advancements that can be foreseen at this time will not change the picture with respect to these minerals over the next 20 years.

Senator FORD. Will these experts that you are drawing upon for advice and counsel be included in your report?

Mr. SEAVER. With their permission, they will be.

Senator FORD. In the second paragraph on page 2, line 4, you say a coherent approach overlaying and integrating the parts. You also say that R. & D. efforts embrace only part of the current problem. What do you mean by a coherent approach overlaying and integrating the parts?

Mr. SEAVER. Let me answer that by giving you an example. The study we have been involved in addresses a particular part of the problem, namely the supply side and only supply from this particular area of the country.

Senator FORD. You mean this particular area of the world?

Mr. SEAVER. This particular area of the world, I'm sorry. What needs to be done is have a coordinating mechanism that will assure that this kind of effort is tied to other efforts, such as efforts to identify how technological advances can reduce our cobalt use.

If we look at our study and it says that there is a good chance that there will be reduced supplies of, say, cobalt from this area of the world over the next 20 years, that doesn't tell the whole picture. We also need to know what the demand is going to be for that material and we need to know what other things can be done, if there is a difference between demand and supply. It's important that there be coordination among these efforts so that information is not lost between different studies.

Senator FORD. On the same page, next to last paragraph, you say first and foremost, it must deal—that's the national materials policy—it must deal with all aspects of the material supply problem within a common framework from which the implication of decisions can be easily discerned. What are all aspects?

Mr. SEAVER. Again, it is a matter of we have to look at supply problems and look at changing patterns of demand and we have to look at alternatives that are available to us to reduce these problems and it includes things like recycling, conservation, R. & D. efforts to improve efficiency in the use and production of new sources of domestic supply, new sources of foreign supply, things like ocean mining and so on.

Senator FORD. How are you going to get the American people to recycle?

Dr. HILL. If I may, they are already starting to recycle platinum and cobalt because prices have been driven up. Pull them out of radios and so forth. In that sense, it's economic.

Senator FORD. It's an economic, have-to basis. You couldn't just do it for the good of your country?

Dr. HILL. Certainly.

Senator FORD. There is no flag waving out there, is there, to recycle? You might get the Boy Scouts to do it. In recycling, as Senator Bumpers said earlier, the store we go to, the big sack comes, the double sack, and that way you won't spill everything going up to your home. But they'll give you 3 cents back and I have seen very few people at the store with a stack of sacks, bringing them back. That's money in your pocket.

Dr. HILL. There are health standards that require you to put your own groceries in your own bag. You can't sell your bags back so other people can use your bags.

Senator FORD. When you bring those sacks back, you get credit on your bill and then they have to recycle the sack.

Dr. HILL. Just for the ones you use.

Senator FORD. I saw the lady in front of me get 36 cents. I don't know what the health problem was. Why don't you just bring your own plastic bag? It's like Senator Bumpers said, you go to the grocery store most anyplace outside of this country and you have to take your own little sack.

Of course, as he said, the paper industry has a problem. Other than the economics of it, you don't have any other way to get people to recycle.

Mr. SEAVER. I think that will be the driving force.

Senator FORD. What about Government interference in the marketplace that we will get into in recycling versus virgin?

Mr. SEAVER. I'm not sure I'm qualified to comment on that. I can offer no more than a personal observation and I'm not an economist.

Senator FORD. In your last statement, you say you would like to emphasize two points. First of all, all efforts related to the development of national materials policy should be undertaken within a comprehensive and common framework.

That gets back to your "all" statement a few moments ago. "Second, an implication of this is that there should be a central location of responsibility with the authority to implement needed studies." What agency?

Mr. SEAVER. Again, I would leave that to your judgment. My opinion is that it would be very difficult, as you heard before today, to locate this kind of authority within a single agency and obtain the needed cooperation that would be necessary from other agencies and departments.

Senator FORD. You sound a little like home, I walk in and present her with a problem and I get socked. Based on your experience, where is the most mineral expertise located?

Mr. SEAVER. You mean within Government or anywhere?

Senator FORD. Let's just say Government.

Mr. SEAVER. I suspect within the Bureau of Mines. Let me emphasize that's minerals and not materials, the distinction is necessary there.

Senator FORD. Does it make sense to attempt to establish a policy for all minerals?

Mr. SEAVER. I think, not a policy for all minerals, but what you need is to establish a procedure for dealing with the problems that can arise with respect to minerals. A single policy to deal with all minerals would have to be necessarily—I think it's much more productive to say that we will deal with this problem but we will deal with it on an individual mineral basis.

Senator FORD. Dr. Vogely said a few moments ago that you could substitute food for minerals or substitute anything for the word "minerals" and it would come down in the same place, where we are going.

Mr. SEAVER. You would have to say with the policy, a broad policy, I believe that's true.

Senator FORD. How does the Government affect the economic position of minerals now with a stockpile?

Mr. SEAVER. I think there is historical precedence that would suggest that the Government stockpile does play a role in, for example, the price of minerals. Part of the reason for the very large price hike in cobalt which began in 1978 was the Government stopped releasing cobalt from the stockpile. That was one of many factors but it was one that did play a role.

Senator FORD. So Government is in the marketplace?

Mr. SEAVER. Yes, sir.

Senator FORD. David, I don't believe I have any other questions for you. Something may develop and I will be interested in seeing your final report.

Mr. SEAVER. We will be happy to provide it to you.

Senator FORD. Gary, we are delighted that you were here with David today and we thank you very much for your enlightening testimony.

[The prepared statement of Mr. Seaver follows:]

PREPARED STATEMENT ON THE NATIONAL MATERIALS POLICY ACT

David A. Seaver, Gary A. Hill, and Kurt J. Snapper
Decision Science Consortium, Inc.

July 29, 1980

Mr. Chairman, we would like to thank you and the other members of this subcommittee for the opportunity to present our views regarding a national materials policy. The need for a comprehensive and coordinated policy is clear: many studies have documented the potential vulnerabilities from shortages in the supply of certain critical and strategic materials. The key to a viable national materials policy is the approach taken to its development.

As background to this testimony, let us say that our area of expertise is in strategic planning and forecasting including political risk assessment. Before presenting our ideas on the development of a national policy and the critical elements of such a policy, it may be useful to describe briefly a study we are currently completing that has stimulated our interest and shaped our views on this problem.

We have been investigating the role central and southern African countries can be expected to play in supplying four minerals (chromium, cobalt, manganese, and platinum group metals) to the U.S. over the next twenty years. Our study is not yet complete, so we want to refrain here from drawing conclusions which further analysis may not support. The degree of U.S. dependence on this area is dramatic. We produce no chromium and approximately 38% of our chromite ore and 63% of our ferrochromium come from this area. We also produce no cobalt or manganese and this area is the source of about 70% of our cobalt, 50% of our manganese ore, and 34% of our ferromanganese. The U.S. imports over 90% of its platinum group metals consumption of which about 50% comes from southern Africa. While some argue that ocean mining of

manganese nodules and technological advances in substitute materials research will greatly reduce our dependence, our study indicates that most experts do not foresee these developments significantly improving the U.S. position during the next 20 years.

Our study has involved developing probabilistic forecasts of conditions in the supplying countries and the effects of these conditions on the exports of the minerals. Supply disruptions are then linked to models that forecast potential economic costs to the U.S. should the disruption occur. While the study is not yet complete, it does illustrate a not uncommon problem: the U.S. depends on potentially unstable foreign sources for most of its supply of these minerals.

We mention this study not only to illustrate potential supply problems, but also to point out that it--and other R&D efforts--embrace only parts of the total problem. And no matter how high-quality such efforts are, unless there is a coherent approach overlaying and integrating the parts, a maximally effective solution may not be identified. This integration is difficult because, in part, of the many agencies and Departments over which responsibility is scattered, and the lack of a formal coordinating mechanism and a common framework for addressing the problem. This, then, is what the National Materials Policy Act can do: provide the needed mechanism for the development of a comprehensive approach to identify and implement appropriate procedures for meeting critical materials needs.

We would like to comment on what we regard as critical elements of the implementation of a national materials policy. First, and formost, it must deal with <u>all</u> aspects of the materials supply problem, within a common framework from which the implications of decisions can be easily discerned. Exhibit 1 illustrates such a framework.

We must begin by identifying the potential supply shortages with a careful assessment of possible supply and demand patterns. On the supply side this will require consideration of possible new sources both domestic and foreign,

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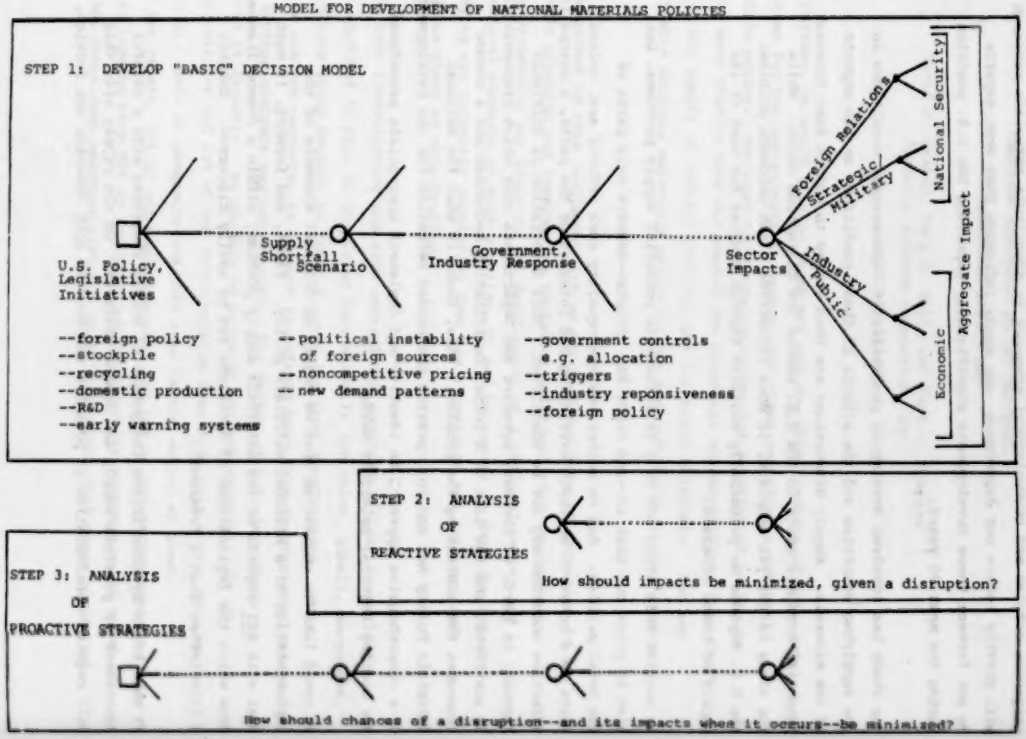
Exhibit 1

MODEL FOR DEVELOPMENT OF NATIONAL MATERIALS POLICIES



improved efficiency in production, recycling, and the stability and reliability of foreign suppliers. We emphasize the latter because often it may be the variable in supply over which the U.S. policy exerts the least control. We need a careful assessment of the current and future security of foreign supply sources.

On the demand side, policy development must consider potential new demand patterns, for example as might be brought about by major new defense systems. The potential for substitution, improved efficiency in use, and conservation must also be considered.

As the potential for shortages is identified, the impacts of such shortages must be considered. Impacts will be diverse, yet cannot be addressed independently. Economic impacts should be considered simultaneously with defense issues and foreign relations because tradeoffs may be involved and should be made clear.

With this basic framework in place, we can begin an examination of the strategies the U.S. can adopt to reduce shortages and mitigate their impacts. Two types of strategies should be considered which we have labeled "reactive" and "proactive." Reactive strategies are those which are adopted in response to an actual shortage. The development of contingency plans to implement reactive strategies can mitigate the effects of shortages. Such plans may include government allocation, stockpile release, industry substitution, foreign policy actions, etc. U.S. materials policy should include contingency plans based on their relative cost-effectiveness.

Proactive strategies, on the other hand, are those adopted prior to a shortage to reduce the chances of its occurrence and reduce its impacts if it occurs. A wide range of proactive strategies exists and should be examined on a cost-effective basis. U.S. foreign policy can play a role in the stability of foreign supplies. Stockpiling can be (and is being) undertaken to meet short-term shortages. Early warning systems can be developed to provide

advanced indication of impending shortages and thus increase our time to prepare responses. Programs can be undertaken to stimulate recycling, domestic production, and research and development to improve efficiency of production and use. These various strategies must be examined in terms of their effects on the chance of a shortage occurring, the effects of the shortage if it occurs, and the cost of implementing the strategy.

In closing we would like to emphasize two points on which we feel the effectiveness of a national materials policy will rest. First, all efforts related to the development of national materials policy should be undertaken within a comprehensive and common framework. And second, an implication of this is that there should be a central location of responsibility with the authority to implement needed studies. Although these points cannot ensure an effective policy, without them there is little chance for improving existing practices.

Senator FORD. The next witness is Herschel Cutler, executive director, Institute of Scrap Iron & Steel, Inc., Washington, D.C.

STATEMENT OF DR. HERSCHEL CUTLER, EXECUTIVE DIRECTOR, INSTITUTE OF SCRAP IRON & STEEL, INC., WASHINGTON, D.C., ACCOMPANIED BY E. BRUCE BUTLER, PATENT ATTORNEY

Dr. CUTLER. Good morning, Mr. Chairman, and thank you for the invitation and the opportunity to appear on behalf of the metallic scrap processing industry in regard to the Commerce Committee staff draft version of H.R. 2743.

My name is Herschel Cutler. I am executive director of the Institute of Scrap Iron & Steel, Inc., headquartered in Washington, D.C. The institute is a national trade association representing the metallic scrap processing industry. Institute members handle approximately 95 percent of the ferrous scrap purchased domestically and exported and equally impressive percentages of the other scrap metallics.

The findings of the draft are indeed laudable and easily supportable by all citizens, as is the declaration of policy. What is lacking, however, is a true appreciation of the role that recyclables could play and the reason why that goal will not be attained unless changes in Government policy occur—changes not fully envisioned in the draft.

First, the draft ignores the role of demand as the critical function leading to underutilization of recyclable materials. The markets for scrap materials are not constrained by technological considerations; they are not limited because sophisticated means to process the materials do not exist. They are not limited because of inadequate supply.

Indeed, the inventory of recyclable but not recycled scrap iron is 700 million tons and tragically growing each year. Tragic because when the scrap inventory backlog grows, the inventory of virgin materials, natural resources goes down.

Scrap use is limited because the demand for raw materials, be they virgin or recyclable, is tilted toward the virgin and that tilt

has not been properly addressed in the past and is not properly being addressed by this draft. Thus, the first item that needs repair is the matter of stimulating demand for additional purchases of recyclable materials.

The Government can help greatly in that regard. For example, the average railroad rate for the movement of scrap iron is almost three times the average freight rate on the virgin competitor—iron ore. The Interstate Commerce Commission has had a long history of insensitivity to such rate discrimination and that posture continues to this very day.

Second, with respect to depletion allowances, the user of virgin ore gains the benefit of depletion but the user of recyclables does not. Past Congresses considered depletion offsets for the user of recyclable materials to neutralize the tax distortions inherent to depletion but the bills failed—narrowly, but failed nonetheless—in both Houses.

Third, the Office of Management and Budget continues to consider scrap processors as wholesalers in the Standard Industrial Classification. This listing, admittedly wrong as a factual matter but continued as a statistical matter, to avoid upsetting the statistical purity of the data, means that laws and regulations affecting wholesalers improperly apply to scrap processors.

The incredible energy savings involved in scrap usage in steelmaking instead of iron ore are well known but do not seem to impress the OMB. In the last allocation system for energy, and I refer specifically to electricity, many scrap processors were unable to obtain needed power to process more scrap iron and promote true energy conservation in steel making because wholesalers received less than their base historical use in many States and not the 100 percent of the base use enjoyed by manufacturers as defined by the SIC. It is clear that someone is missing the forest for the trees.

How many products can show a 74-percent saving in energy use when it is used instead of the competitive material? How many products save 40 percent of the water used by the competitor, 86 percent of air pollution resulting from the alternative and 76 percent of the water pollution otherwise generated?

Moreover, using scrap to make steel means that huge savings in natural resource exploitation can occur—1½ tons of iron ore and 700 pounds of coal are saved for each ton of scrap iron used.

All of these facts are known, yet progress is not forthcoming toward the goal of added recycling. Indeed, the Department of Energy seems totally insensitive to these benefits, as do most other Federal agencies. The Department of Energy, in fact, has just set targets for 1987 scrap consumption in the steel industry at 41 percent of total raw material consumption.

In 1979, the steel industry average was already at 40 percent. The absurdity of estimating the technological maximum scrap use at 1 percentage point higher in the next 8 years is obvious. The institute believes that much of the problem with respect to these targets and they were, as you know, Senator, congressionally mandated targets, can be blamed on the use of an outside consultant, Arthur D. Little, Inc., which has a long-standing relationship with the steel industry and admittedly adopted viewpoints of the steel

industry on the question of targets. DOE is subject to criticism both for selecting this consultant and for adopting the recommendations once the report was submitted.

There is no need for additional Government technology studies—the technology of metallic extraction from waste is known and is improving through the efforts of private industry on a daily basis. If there were money to be made recycling tin cans, wouldn't the profit oriented recycling industry be doing it?

The role of the Government in this regard is most questionable when the steel industry tells you it will not increase the charge of scrap iron used. In other words, the mills say they will use the same amount of scrap, all things being equal, but if they are forced to use tin cans, then they will use less of the scrap presently being recycled by private industry.

Thus, if the presently recycling material cannot recycle or some of it cannot recycle, the only result is for it to lie on the roads and streets and mar the countryside or else at public expense, to be hauled to the very landfills that formerly received the tin cans which now are recycled at public expense. It seems that this circularity of reasoning was best expressed in the children's song called "There's a Hole in the Bucket."

Another example of such faulty reasoning is the current interest on the part of the Government in the matter of airbags for automobiles. While the scrap processing industry obviously supports measures to save human life and avoid human suffering, the use of sodium azide as the propellant in such protective devices certainly is questionable.

First, the material is considered hazardous by EPA.

Second, its explosive and toxic characteristics make it completely objectionable from a human and property point of view in scrap processing facilities when the autos reach the end of their serviceable life and still contain unspent airbags.

Third, the residues containing sodium azide which will arise when the junk hulks are processed would be very hard, if not impossible, to dispose of safely and economically. Yet with all these problems, the subject continues to have avid supporters.

Indeed, the whole question of hazardous materials points out the problems and inconsistencies. It is perfectly all right to include hazardous materials, for example, sodium azide in a product—an automobile—and let it circulate as part of that product for years.

But the material becomes a problem only when the hazardous material becomes a hazardous waste, when the automobile is processed to recover the scrap metal. At that time, when the hazardous material becomes a hazardous waste, in the face of the incredible cost associated with hazardous waste disposal, it might not be economically viable to handle junk hulks and obviously recycling will suffer.

Who is looking at the big picture?

The same is true where lighter weight cars are advocated in the interest of energy conservation. The alloying of steels to lower weight and yet retain the needed strength seems like a logical and proper action, yet the presence of these alloys—generally extremely valuable in their own right—means that the recyclable steels

resulting from such hulks are "contaminated" and cannot be used for many steelmaking operations.

Accordingly, the end result is a limited general market and indeed acceptability in the main in lower quality steel markets where the valuable alloy can be tolerated—not appreciated. In other words, the valuable alloying elements could end up in reinforced concrete and never be recovered with the obvious negative impact that those alloys are lost forever and the steel scrap is downgraded from more desirable uses. This is the long-run possibility that can be averted with immediate R. & D. programs to find substitutes.

The GAO, in a report to Congress on "Policy Conflict—Energy, Environmental and Materials: Automotive Fuel Economy Standards Implications for Materials" concluded: "The complex and competitive relationship among national goals for energy, the environment and materials has not been recognized in Federal policy formulation." It is this subject, materials conservation and substitution, that should receive Federal interest and funding.

Yet no real fears seem to be articulated by the Government as a result of these and other situations, but when the recycling industry says look at what is happening, such words are generally regarded as a self-serving utterance and no more.

The list of governmental actions which limit the recycling in this Nation is tragically large and reflects, in the main, an unwitting failure to appreciate the result of what is perpetrated. Certainly additional recycling means more business for the processing industry and hopefully more profits as well.

But so long as the public good is parallel with that effort, it clearly is in the public interest to move in that direction. We as a Nation talk about such movement but our actions in retarding progress speak louder than our words in support of that goal.

This draft is an excellent start. What is needed to fill it out and provide a basis for a real materials policy is to recognize the situation facing recyclables and act accordingly. It clearly is in the U.S. interest to maximize recycling. The findings and policy of the draft should indicate an awareness of the barriers and hindrances to recycling that must be removed.

What is needed is an expanded market and that must be shown clearly. Given an equal opportunity to compete in the market, scrap can hold its own. We will all be better off when that opportunity is preserved and strengthened. However, the Government must act, not talk, and the time is fast slipping away for such action.

Thank you, Mr. Chairman.

Senator FORD. Thank you, you raise some interesting points here this morning. Did you identify your colleague?

Dr. CUTLER. Yes, the gentleman sitting with me is E. Bruce Butler and he is an attorney with the firm of Patton, Boggs, and Blow.

Senator FORD. As I asked the witnesses before, how do you get people to recycle? You say in your first shot out of the gun, what is likely is the true role recyclables could play—you're not in the field of recycling aluminum cans and things like that, are you?

Dr. CUTLER. Yes, sir, we handle scrap metallics.

Senator FORD. Since it's lacking, how can we encourage or what can we do, what kind of language should be in the legislation to encourage recycling? I ought to be against it because you say it takes 700 pounds less of coal when you start recycling and I want to sell coal.

So you hit me right between the eyes. I want to get around that a little bit but I'm for that. I have no problems with that.

Dr. CUTLER. I know you want to use metallurgical coal most efficiently, sir.

Senator FORD. That's right, and we will sell the hell out of it if we get the chance. But we have to put all the pieces together. We look at this and get it settled and look at that and get it settled and something else and we try to bring it together with national policy and the pieces won't fit. We need to get into what you are saying.

What is the role that we ought to have in this legislation as it relates to recycling?

Dr. CUTLER. It seems to me you are asking a question that's very difficult to respond to. The problem as I tried to outline in my testimony is that the various aspects of solving the problem are scattered throughout the Government system as a whole, for example, the Interstate Commerce Commission.

Congress has directed the ICC on four separate occasions in this decade to remove freight rate discrimination and it's still there. The Commission has moved slightly but it has not responded to what the Congress has told it to do.

Senator FORD. That's the independent agency we heard about this morning?

Dr. CUTLER. That's one of them.

Senator FORD. We're talking about an independent agency to set up and look at what we're talking about.

Dr. CUTLER. There are four clearly articulated directives of the Congress in the 1970's to the ICC to do this and until the fourth one, there was virtually no progress. The fourth one has moved it, but only slightly. In the case of OMB, the situation is so ludicrous, you can hardly believe it is happening.

We are told that the data are incorrectly stated as a factual matter because of the purity of the statistical data when you show that scrap operators could not function when people needed scrap—with the energy savings, available. If you ask to change the classification showing how the other is justified, you are told they cannot do it.

Congress tried on three occasions to create a depletion offset, and no one in the scrap industry is asking to repeal depletion. What the scrap industry asked on a number of occasions was to neutralize the tax effect on the user of the material.

From the point of view of tax implications, the steel mills should have no determination, no predetermination to use either the virgin or the recyclable material. The Department of Energy, which should be a major advocate of increased recycling, has become one of the major stumbling blocks.

There is no appreciation within the Department of Energy about these targets, which were mandated by Congress, to look at what

the law said. The law said what is the technological limit that could be attained in the year 1987?

The report of the consultants says, we have chosen this number because the steel industry says that's what they will use. It doesn't say that's what they can use, it says that's what they will use.

Senator FORD. Dr. Cutler, the argument you are making is that you are not getting a tax break, you are not getting a cost break that type of thing. If you got that, your people would work a little harder to make more money and therefore they would encourage recycling?

Dr. CUTLER. On the contrary, sir, all of our suggestions are that the break, if you will, the depletion offset which in a way is a tax break—would not come to the people I represent. They would go to the consumer, they would go to the steel mill.

The steel mill is the one who determines whether they will use iron ore or scrap so to give the tax incentive to the scrap industry would be useless. It has to go to the man who makes the decision.

Senator FORD. He will make the decision based on what he can produce to the consumer with his net cost and largest profit.

Dr. CUTLER. That's correct.

Senator FORD. Basically what you're saying is that your industry and those you represent would be a lot better off if you had a better tax break?

Dr. CUTLER. I don't represent the steel mills.

Senator FORD. I understand that you represent the scrap people and that's recycling. If recycling gets a better break——

Dr. CUTLER. As I have said in the testimony, if there is more volume, we will make more profit.

Senator FORD. I have been a small businessman, I understand the difference between loss and profit and I think what you are talking about is profit.

Dr. CUTLER. That is correct.

Senator FORD. If you get more profit, you will get more interest and there will be more recycling. The choice will be made at the plant, the steel plant, the steel mill, wherever it is, on what can give them the biggest break. You are talking about profit.

Dr. CUTLER. We're talking about steel profits as well as scrap industry profits.

Senator FORD. I understand that but you are talking about a way to get it recycled.

Dr. CUTLER. That's right and it will answer partially the question you began with which is how do you get people to do more recycling on their own?

Senator FORD. You make more money.

Dr. CUTLER. I'm talking about the average man bringing back——

Senator FORD. You go get it if you're going to make more money.

Dr. CUTLER. That's absolutely right.

Senator FORD. Now we're getting down to it. That's the basic of it and what you're saying is the true appreciation of the role recycling can play will be based on the amount of money they can make. I can see trucks coming down to the country and bringing cars out of the ditches if they can make a few bucks off the axle.

Dr. CUTLER. That's right and that's the answer to additional recycling.

Senator FORD. I got 5 cents a gallon less picking strawberries at one farm than I did across the road so I went over to the other farm and made an extra nickel. I understand what you're saying, you're just not saying it correctly, you're being very kind and your attorney—I understand you asked him to push back a little bit but I understand where you're coming from and you are right. Represent him properly, if you don't, you ought not be hired. [Laughter.]

You have average railroad rate for moving scrap—it's almost three times. Why, is it harder to haul scrap, can it get as much weight on?

Dr. CUTLER. We've done a major study in that effort and came up with the conclusion we should be paying 1½ times the rate on ore but not three times.

Senator FORD. But you agree it pays more to move scrap than ore?

Dr. CUTLER. Absolutely, and we agree the rate should not be the same.

Senator FORD. Then you get to the depletion allowance so you have three places and it's all cost.

Dr. CUTLER. It is to lower the relative cost of your product in the marketplace, to overcome the distortions in the marketplace and make the virgin material more attractive, artificially, to the user of the virgin or secondary material. We are trying to overcome the artificialities in the marketplace.

Senator FORD. What is the statistical purity?

Dr. CUTLER. That's the question I asked. They tell me since the SIC has been in existence for x number of years, if you remove something from the category it's in, you have to go back and recreate the last 30 or 40 years of data.

It is not comparable anymore and we were told the SIC should not be used for these purposes, but it obviously is. They figure it's statistical and it has no policy implications. No matter what we have been able to show them, the answer is that it is a statistical tool and not for policy purposes.

By the way, sir, that is open at the moment. We have just submitted another request to change that. The 1982 census is being considered at the moment.

Senator FORD. When you say many scrap processors are unable to obtain the needed electrical power to process more scrap and promote true energy conservation in steelmaking, I don't understand that.

Dr. CUTLER. In 1973–74, the allocation basis was 80 percent, particularly on the west coast where it was more serious. The States allocation plan said if you were an SIC—wholesaler, you got 80 percent of your basis. If you were an SIC manufacturer, you got 100, and many of our major processors were working 4 days a week because they could not operate the equipment the 5th day, they could not get the electric power.

Senator FORD. Is that on the west coast predominantly?

Dr. CUTLER. This again was in 1974 when there was an allocation system in effect. It also applied to diesel use in many of our facilities.

Senator FORD. Do you have an electrical problem today?

Dr. CUTLER. No, sir.

Senator FORD. You alluded to it here.

Dr. CUTLER. I said were unable. Certainly it could come back again because the States have to fall back on something and they fall back on the SIC.

Senator FORD. But you don't have that problem today as far as electrical power is concerned?

Dr. CUTLER. No, sir.

Senator FORD. How does the 700-million-ton backlog of recyclable iron relate to the amount actually recycled each year?

Dr. CUTLER. The biggest year in history was 1973 when it was just about 60 million tons.

Senator FORD. So you have a 10-year supply?

Dr. CUTLER. Assuming there is no more scrap coming out. But we know between 70 and 80 million tons a year comes out new each year.

Senator FORD. It's gaining about 20 million tons a year.

Dr. CUTLER. I can provide that, we have a study through the year 1977 showing additions and subtractions.[1]

Senator FORD. How much of this goes to Japan?

Dr. CUTLER. Depending on the year, somewhere between 1 and 2 million tons.

Senator FORD. Is that all?

Dr. CUTLER. Yes, sir, maybe 2½ million and I can get you that exact figure.

[Dr. Cutler supplied the following:]

The average annual shipments to Japan during the years 1975-79 were 2.16 million net tons.

Senator FORD. I understand Japan got their ore from Australia and we had that alluded to earlier and scrap from this country.

Dr. CUTLER. The Japanese get some of their scrap from this country as do many of the other countries in the world.

Senator FORD. What about specialty steel scrap? Don't you have a specialty steel scrap iron that Japan would take?

Dr. CUTLER. You may be making reference to stainless?

Senator FORD. Yes.

Dr. CUTLER. Sure, we sell stainless scrap in the world as well, nowhere near those volumes.

Senator FORD. What is export scrap steel from this country annually, all of it?

Dr. CUTLER. The record year was approximately 11 million tons.

Senator FORD. When was the record year, last year?

Dr. CUTLER. No, it was 1973 or 1974. I believe—I will provide that as well.

[Dr. Cutler supplied the following:]

The 1973 total of exports was 11.26 million net tons.

Senator FORD. Everything you talk about is 1973 and 1974 and that was your best year and that's the same year we had the embargo. Did it play any role in this?

[1]Subsequent to the hearings Dr. Cutler supplied the subcommittee with the study for the period ended in 1975, and two updates (through 1977, and through 1979). Due to the voluminous nature of the material supplied, the studies are retained in subcommittee files.

Dr. CUTLER. I don't see any relationship. As you recall, 1973-74 was a major year of commodity activity, the prior witnesses discussed the short supply study, Commission on Short Supply, it was concerned with 1973-74.

Senator FORD. How much did you export last year?

Dr. CUTLER. I will get the exact figure for you but it's in the range of—I think it's approximately 10 million tons.

[Dr. Cutler supplied the following:]

The 1979 total of exports was 11.05 million net tons.

Senator FORD. So it's close to your best year?

Dr. CUTLER. That's correct, sir.

Senator FORD. Has it stabilized over the last 7 years?

Dr. CUTLER. No, it moves up and down just as the domestic, virtually the same. There are many other buyers besides Japan. Major buyers in the world include the Spanish, Italians and our two closest neighbors, Mexico and Canada, which are extremely large buyers of American scrap.

Senator FORD. Your major concern today is one, you have 700 tons—where is that 700 tons stored—700 million tons, I'm sorry.

Dr. CUTLER. It is in what is generally referred to as involuntary storage. Some of it is in auto wrecking yards, auto graveyards. Some of it is obviously and easily seen as abandoned railroad track, abandoned trolley track, abandoned plants and equipment, abandoned oil refineries.

Senator FORD. It's not something you just walk back there and back the magnet up to?

Dr. CUTLER. Some of it is, but generally not.

Senator FORD. How much of a stockpile do you have that you could go get if someone gave you an order today?

Dr. CUTLER. My response will be something like the response Senator Bumpers had to a question he asked earlier. There are 700 million tons available—in a reasonably short period of time, if the price is right. It costs a lot of money to go out and get it.

If the price is right, it will move, and that was demonstrated year after year. It was demonstrated in 1974 and again last year when the demand for scrap went up and in a very short time frame the scrap is available.

The reason the price moves so quickly, both up and down, is that scrap is bought on a 30-day contract. Most other major steelmaking materials are bought on 20 year or totally owned life of the mine contract. Scrap is purchased on a 30-day contract which is unstable as to price.

Senator FORD. Let me ask the question again. If you got an order today, how much would you produce in the next 30 days?

Dr. CUTLER. At what price?

Senator FORD. The going rate.

Dr. CUTLER. Virtually all that can be used in the next 30 days, absolutely assured you would have it in 30 days. If you ask for more than the amount—it's a very low level of steel usage at the moment with steel mills running at about half their capacity—if you wanted to double that in the next 30 days, the price would be much higher.

Senator FORD. What is the price today?

Dr. CUTLER. $70, $75 for the prime grade.

Senator FORD. Per ton?

Dr. CUTLER. Yes, gross ton and very hard to sell, by the way. That's the price, but it doesn't necessarily mean you would get any buyers.

Senator FORD. Your problem or the problems you relate could be some of the problems that would be looked into as it relates to this independent agency or whatever you are trying to get to. I don't think I have any questions but you have whetted my appetite.

Dr. CUTLER. Thank you, sir, I appreciate the opportunity.

Senator FORD. You are very kind to be here, Dr. Cutler and Mr. Butler.

Next is Prof. Richard Wright, Cardozo Law School, New York, N.Y.

STATEMENT OF RICHARD W. WRIGHT, ASSOCIATE PROFESSOR OF LAW, CARDOZO LAW SCHOOL, YESHIVA UNIVERSITY, NEW YORK, N.Y.

Professor WRIGHT. I guess I will skim through the statement.

Senator FORD. Fine, the total statement will be included in the record and I have a few questions for you.

Professor WRIGHT. I have worked for the Department of the Interior and the Materials Group of the Congress Office of Technology Assessment, focusing primarily on the domestic supply side of materials policy. I was the project director and author of the OTA report, "Management of Fuel and Non-Fuel Minerals in Federal Land," which was completed and distributed to this and other committees of the Congress in April 1979.

I have been asked to include a summary of relevant portions of the OTA report in my testimony today. The summary necessarily will be sketchy and incomplete since the report is thick and covers many different issues. I also wish to emphasize that my testimony is solely my own and that I do not speak for OTA.

Apparently much of the impetus behind and testimony on the proposed bill concerns the availability of minerals in land owned by the Federal Government, both onshore and offshore. The OTA report dealt with the availability of minerals in Federal onshore land exclusive of Indian land.

The report concluded, as have many other studies, that onshore land owned by the Federal Government or obtained from the Government by private parties under the Federal mineral laws is one of the more important sources of domestic mineral resources.

Federal onshore land now constitutes almost one-third of the Nation's onshore land and the Government will still own over 27 percent of the onshore land after the completion of the Alaska State and Native land selection process. The Federal land is concentrated in the areas of the Nation considered to be most favorable for the occurrence of economic mineralization.

Most domestic nonfuel mineral production has come from the Federal land areas which contain the bulk of the known domestic resources of a majority of the metallic minerals. They also contain major resources of coal, oil shale, geothermal steam and uranium in addition to proportionately smaller but nevertheless significant resources of oil and gas. Much larger resources of oil and gas may be found in Federal offshore land.

The OTA report identified three major areas of concern with respect to exploration, development and production of the mineral resources in Federal onshore land: First, impediments to efficient mineral activities, considered solely from a mineral production perspective posed by the existing collection of Federal mineral laws, second, problems in reconciling mineral activities with nonmineral activities and values and third, problems of interagency and intergovernmental cooperation and coordination.

I shall summarize the first area of concern very quickly since I believe the committee will find the second and third areas more directly relevant to the discussions on the proposed bill. In brief, OTA found that the existing Federal onshore mineral laws, enacted over more than a century, are a patchwork that has significant gaps in coverage, treats physically similar lands or mineral depositions differently and impedes multiple mineral exploration, development and production.

Access to Federal land for mineral activity is uncertain under each of the mineral laws. Even after access has been obtained, tenure for exploration is highly insecure under the mining law and tenure for development and production is uncertain for all minerals under the mining law and for nonfuel minerals under the mineral leasing laws.

Tenure lengths and conditions, on the one hand, force unnecessary and inefficient work and yet on the other hand, are insufficient in themselves to assure diligent exploration and development or proper conservation of mineral resources. I refer you to chapter 4 of the OTA report for a detailed discussion of these and related issues.

The second area of concern—reconciling mineral activities with non mineral activities and values—has been a subject of considerable debate for the past several years and is the focus of chapter 5 and appendix B of the OTA report. The debate has centered on the withdrawal of large amounts of Federal land from availability for mineral activity.

A few figures should help to put the issue in perspective. OTA, after a fairly careful and thorough analysis, estimated that in 1975, 34 percent of the total Federal onshore land, both public domain and acquired, was formally withdrawn from hard rock mineral activity and 39 percent was formally withdrawn from nonhard rock mineral activity.

Land was counted as withdrawn only if it was not available under any legal arrangement, for example, mining law, special Federal leasing law, State mineral law, Alaskan Native contract, et cetera. In addition to the land formally withdrawn, an estimated 6 percent of the total Federal land was highly restricted for hard rock mineral activity and 10 percent was highly restricted for nonhard rock mineral activity in 1975.

The highly restricted classification included land which, while formally open to mineral activity, was restricted by statutory or administrative conditions to such an extent that mineral activity was greatly discouraged, although it sometimes did occur.

The 120 million acres subsequently withdrawn in late 1978 by the executive branch for national conservation systems in Alaska almost entirely overlapped already existing withdrawals. They

were estimated to have resulted in closure of an additional 1.6 percent of Federal land closed to hard rock mineral activity.

The OTA report did not assess the effects of the RARE II and BLM wilderness inventory programs which were initiated too late to be included in the OTA calculations. However, it has been reported that 36 million of the 62 million RARE II acres and 124 million of the 174 million BLM wilderness inventory acres have already been dropped from further consideration for wilderness and a significant portion of the remaining inventory areas were probably part of the earlier RARE I process or were BLM primitive or natural areas so that the net increase in closed or highly restricted land due to these programs is currently probably no more than 7 to 9 percent.

If this is the case, then about 55 to 60 percent of the total Federal onshore land is now closed or highly restricted for nonhard rock mineral activity and about 45 to 50 percent is closed or highly restricted for hard rock mineral activity.

These nationwide withdrawal/restriction figures, however, still do not provide a true general picture since they are seriously distorted by the extensive Alaska land transfer and designation process. In 1975, about 45 percent of all Federal onshore land was in Alaska and almost all of the Federal land in Alaska was withdrawn from any activity under the Federal mineral laws to permit orderly selection and transfer of approximately 150 million acres to the State of Alaska and the Alaskan Natives and designation of major additions to the Federal national conservation systems.

Much of the State and Native-selected land, however, was available for hard rock mineral activity and some was available for nonhard rock mineral activity under State mineral laws or agreements with the Natives.

As table 1 shows, only 24 percent of the Federal onshore land in the lower 48 States was closed or highly restricted for nonhard rock mineral activity in 1975 and only 26 percent was closed or highly restricted for hard rock mineral activity.

The currently remaining RARE II and BLM wilderness inventory areas might add 10 to 15 percent more to the highly restricted category for both hard rock and nonhard rock minerals so that about 35 to 40 percent of Federal land in the lower 48 States is probably either closed or highly restricted for mineral activity at the present time.

These percentages may decrease to 33 percent or less when all steps of the wilderness review process, including congressional consideration, are completed.

How significant are these withdrawn and restricted areas as possible sources of mineral production? No one can really say. Many of them are now military bases or qualify for wilderness consideration, precisely because they have historically been considered to be poor mineral prospects and thus have not been developed.

But new exploration and production concepts and techniques might produce economic mineral deposits where previously none were believed to exist. The only way to find out, short of Government exploration, is to open the areas up for private exploration.

This poses a fundamental dilemma for the Federal land manager or Congress itself as the ultimate decisionmaker. The OTA report found that under the mining law as written and the mineral leasing laws as administered, mineral rights, once acquired, can override all nonmineral resource values regardless of the relative weight of the mineral and nonmineral values.

The absolute preference given to mineral activities is clearly recognized in the Forest Service surface management regulations and the proposed BLM regulations applicable to activities under the mining law which emphasize that the land manager's authority under the law is limited to requiring mitigation of unnecessary surface impacts.

Moreover, once a valuable mineral deposit has been discovered under the mining law, the miner is entitled to obtain a patent which conveys full title to the surface as well as the subsurface from the Government to the miner so that the Government can no longer even require mitigation of surface impacts but rather faces further possible disruption of land use planning and management on the surrounding Federal land as a result of the private inholding.

In sum, when land is withdrawn from mineral activity, the resulting multiple use management is exclusive of mineral uses. But under the current mineral laws, when the withdrawal is revoked to allow mineral uses to be part of the multiple use mix, the mineral uses immediately subordinate and overwhelm all nonmineral uses, no matter how valuable the latter might be, as soon as mineral rights are initiated. Multiple nonmineral use is replaced by a single mineral use.

There is an especially high potential for undesirable preemption of nonmineral resource uses under the mining law since mineral rights are acquired under that law by simply staking a claim. As Thomas Walthier, a mining industry official, recently wrote:

> The bureaucracy can't obstruct, hinder or deny the right to stake a claim. The decision rests entirely in the private sector. The bureaucracy can't stop or delay the right to explore, except recent restrictions under some environmental and land use laws, or finally they don't have a say whether or when mining can begin.

Since withdrawals are the only means of controlling entries under the mining law, whereas entries under the mineral leasing laws can be controlled more flexibly through approval or rejection of individuul applications or incorporation of strict conditions into the least, it might be expected that ordinarily, withdrawals would be invoked more often against mining law activities than against mineral leasing—nonhard rock—activities and such indeed appears to be the case.

Table 1 indicates that almost twice as much acreage in the lower 48 States was withdrawn in 1975 from hard rock activities under the mining law as was withdrawn from nonhard rock—mineral leasing—activities. Some of the acreage withdrawn from mining law activities was open for exploration and development under special hard rock leasing statutes; hence the 16.2-percent figure for hard rock activity under any law.

Activities under the mining and mineral leasing laws are subject to Federal and State air quality, water quality, and other environmental laws of general applicability that sometimes impose strin-

gent requirements for mitigation of certain specific impacts resulting from mineral activity.

However, these general environmental laws do not reach the central issue of the proper allocation and use of the tract of land involved and all its mineral and nonmineral resources. Under the current mineral laws, that decision is automatically made in favor of mineral activity if the land is not withdrawn from activities under the mining law or if a lease is issued for mineral exploration and development under the mineral leasing laws.

Withdrawals are made to protect many types of nonmineral and even mineral resource uses and values, including administrative sites, dams, military security, water supplies, physical improvements, opportunities for State and native land selections, cultural resources, scenic vista, wilderness, wildlife habitat, pipelines, and oil shale resources.

The reason for some of these closures may be the lack of a provision in the mineral laws for compensation for nonmineral facilities or values damaged by mining. That is, even where mining would be the highest and best use of a tract of land, the Federal land agency is not willing to permit mining when no compensation would be paid for the cost of replacing and relocating substantial improvements or natural resource values.

Moreover, the traditional premise that mineral activity is always the most valuable use of a tract of land is increasingly being rejected. The net value of many mineral deposits being discovered today is lower than the net value of deposits worked in the past, due to increasing expenses and decreasing ore quality.

At the same time, many nonmineral resources are seen as being at least as limited in physical supply as many mineral resources and unlike the nonfuel minerals, subject to permanent loss. Other, less unique nonmineral resources are also being valued sufficiently high that Congress or a land management agency is not willing to run the risk of their being preempted by a claimant of some fairly common or marginal mineral deposit, and therefore, withdraws the area from mineral activity.

Viewed in this light, the substantial withdrawals of Federal land from mineral activity seem to be not the results of a misguided, unbalanced, antimineral policy, but rather the consequences of efforts to try to create some sort of balance among mineral and nonmineral uses of Federal land.

Until about 20 years ago, there were few withdrawals and mineral patents and leases were granted routinely with little thought given to the effect on nonmineral resource values. The so-called withdrawal problem is thus not likely to abate until additions or adjustments are made to the mining and mineral leasing laws themselves to satisfy concerns about nonmineral resource values. A fuller discussion of the issues and options is contained in chapter 5 of the OTA report.

The third and final major area of concern addressed by the OTA report, in chapter 6, encompasses problems of interagency and intergovernmental cooperation and coordination. In the interest of brevity, I will touch on only a few of the issues.

OTA found that the traditional separation of mineral resource disposal and management from multiple use management of non-

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mineral resources under the Federal land laws, which has led, among other things, to the withdrawal problem discussed above, has been carried over into the administration of the mineral laws themselves with adverse effects on efficient, integrated management of Federal resources.

For example, the mineral leasing function entrusted to the Department of the Interior has itself been split into mineral—economic and engineering—aspects and nonmineral—surface impacts—aspects, with responsibility for mineral aspects given to the USGS and responsibility for nonmineral aspects given to the BLM.

The new Office of Surface Mining has a significant role in both the mineral and nonmineral aspects of coal mining operations. Because minerals are bound up in the land, mineral related issues invariably affect nonmineral resources and nonmineral related issues usually impact mineral resource development.

The attempted formal distinction between economic—mineral related and multiple use—nonmineral related—aspects of mineral management itself quickly breaks down in practice causing substantial coordination problems and preventing integrated management of Federal land resources.

Thus, USGS and BLM have increasingly moved to joint responsibility for many aspects of mineral leasing on land under BLM's jurisdiction despite the formally mandated separation of functions. Unfortunately, however, during the creation of the Department of Energy by a new and inexperienced administration, the artificial distinction between economic and multiple use land management aspects of fuel mineral leasing was incorporated in the DOE Organization Act which transferred the economic aspects from the Department of the Interior to DOE.

Now, two separate departments, rather than two agencies in the same department, must contend with this distinction and its adverse consequences for integrated land management.

It seems to me that a significant potential for even more serious coordination problems would be created by the proposed National Materials Policy Act of 1980 since it essentially directs the Department of Commerce to undertake a series of activities that are already the responsibility of the Department of the Interior and which depend for their performance on the resources of Interior agencies such as the Bureau of Mines, the USGS, and the BLM.

Better results might be obtained by focusing on Interior's performance of its responsibilities rather than saddling the Department of Commerce with a duplicate of the vaguely worded Mining and Minerals Policy Act of 1970.

Senator FORD. Thank you very much. Professor, let me ask you two or three questions. You have a concise and complete statement and I appreciate that very much but let me ask you this. Do you think a focus of minerals or materials policy is needed?

Professor WRIGHT. Either one you mean?

Senator FORD. Yes.

Professor WRIGHT. I think that in terms of mineral policy in serving potential problems, for example, where do we have possible supply restrictions, what supply possibilities are available from Federal land, what can be done to achieve a better balance to open up some of those areas while still protecting nonmineral resources

that are not protected now, a lot of those questions could be addressed usefully in an overall minerals policy.

I'm not sure there is much to be gained from including timber and fiber and other nonmineral materials. I think there are efforts, I understand, already underway in the Interior Department to try to install some early warning system to try to bring in different problems.

I think if Congress simply looked at what the Interior is doing now, passing another bill that says go out and bring us a recommendation, which has been done over and over again. If instead they directed the Interior Department, the Energy and Resources Division which is already doing some of this, simply order that they undertake better collection and dissemination of information, that they are required to put into place some sort of staff, maybe a liaison committee in connection with other agencies.

If they are told to perform certain functions and given the mission of looking at tax aspects as well, it would be a better way of going about it.

Senator FORD. If we appoint this type of group that you are talking about, where should it be located?

Professor WRIGHT. There are several different considerations.

Senator FORD. But if you had the decision to make today, where would you put it?

Professor WRIGHT. Where I would tend to put it, I believe, is in the Interior Department, in the Energy and Resources Division of Interior.

Senator FORD. Wouldn't that get you in conflict with the Department of Commerce and then you get a DOE and Department of the Interior split over who has responsibility for what?

Professor WRIGHT. The reason I say Department of the Interior, I see that most of the problems people are concerned about are on the supply and demand side, try to get a grasp of what the demand is, how materials flow through the economy and where the supply is coming from.

My understanding of different agencies and departments is that their capacities are focused most in the Department of the Interior. The Bureau of Mines is closer to most of those things and the U.S. Geological Survey is supposed to do a lot of it and the Bureau of Land Management is supposed to be looking at supplies on Federal lands.

When you get into development, the Bureau of Mines again is mostly responsible for development technology, mining technology. Perhaps not so much other agencies on durability and substitution, but some even there.

The materials problem is so data linked, for example, the CEQ on environmental quality to pick out certain issues. The real root of the problem is trying to collect and understand the tremendous amount of data on hundreds of different minerals.

The only agency I am aware of that has that capability is the Department of the Interior. Any agency that wants to have any impact has to draw on that data base and they can draw on it only if they control it. It seems to me a mandated early warning system, taking a broader perspective, looking at tax data which they would not do ordinarily, might be effective than trying to create some-

thing like a CEQ or independent agency that does not have the resources and won't be able to coordinate with other agencies.

Senator FORD. If you had the ability today to make some changes, what changes in the law would you recommend at this point to help us establish a viable national minerals policy?

Professor WRIGHT. I'm not sure you can establish a viable national minerals policy. There are too many different commodities and too many things that affect them. It seems to me you can establish a place in Government where data is collected and disseminated to the agencies that have an impact on minerals.

This particular staff tries to monitor activities in other agencies and let them know when they have materials impacts, just as DOE supposedly considers the energy aspects of things that it does over other agencies and tries to advise them.

It seems to me so far the basic minerals policy in the Government has been in the Department of the Interior. If they are told to quit studying and do more in the light of what they are doing now and have a monitoring facility, maybe with some sort of liaison committee, Congress can mandate that each agency is particularly important to have one or more persons permanently dedicated staff to work with people in the Interior.

From my experience, unless you have that staff dedicated to doing that, every agency will be responding to day-to-day fires and the emergency of the moment, just as Congress does.

Senator FORD. Do you believe that concern over nonfuel minerals supply could be eliminated by withdrawing Federal lands from mineral entry?

Professor WRIGHT. From our study and so forth, I don't believe it would, particularly in terms of the critical material we are talking about. The survey of mineral resources indicated that several critical minerals did not have a strong potential for occurrence on Federal land, withdrawn or not withdrawn.

Others had substantial resources, some were economic, some close to being economic. But it would not eliminate import dependency. I think you want to develop minerals on Federal land in an efficient way and you don't want to have areas locked up that might produce minerals and you don't know that you might find a bonanza find.

But it seems certain areas of the world are strong in certain minerals and other areas are strong in other minerals. I don't think opening up Federal lands, particularly when these withdrawn areas are withdrawn because they did not seem to have mineral potential beforehand. They are sort of leftover remnants and I don't believe opening those up would solve the minerals problem which is more economic competition problems with other countries.

Senator FORD. A final question. You say in your statement that USGS and BLM have increasingly moved to joint responsibility for many aspects of mineral leasing on land under BLM jurisdiction. Can you describe any of these efforts to me?

Professor WRIGHT. Going back several years——

Senator FORD. Five, ten, fifty?

Professor WRIGHT. 1970, I would say. USGS was told you handle the economic aspects of leasing, the royalties, evaluations, even

actual monitoring of operation within the area of the excavation of the mine. BLM handled the leasing function and deciding whether to lease in the first place.

Once it was leased, protection of resources, USGS took over in supervising operations and they were supposed to draft most of the royalty and diligence terms and so forth. The actual practice has worked out that you can't separate things so finely.

The diligence provisions in terms of work requirements and times allowed have an impact on the surface. If you require that there be so much work done within 5 years, you might force interference with the surface. The argument back and forth about what diligence conditions should be, what different types of alternative leasing systems, what sort of royalties should be used, bonuses and so forth, all impact surface as well as nonsurface.

There are arguments back and forth on those issues all the time inside Interior. Three or four years ago, BLM and USGS entered into a memorandum of agreement to move toward joint resolutions of these issues, joint supervision of operations after the lease was issues rather than being the sole responsibility of one or the other.

Senator FORD. Do you approve of that?

Professor WRIGHT. I do.

Senator FORD. Thank you, Professor, that's all the questions I have.

[The prepared statement and a letter received by the subcommittee subsequent to the hearings from Professor Wright follow:]

STATEMENT OF RICHARD W. WRIGHT, ASSOCIATE PROFESSOR OF LAW, CARDOZO SCHOOL OF LAW, YESHIVA UNIVERSITY, JULY 29, 1980, BEFORE THE SUBCOMMITTEE ON ENERGY RESOURCES AND MATERIALS PRODUCTION OF THE SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES, ON THE JUNE 16, 1980 COMMERCE COMMITTEE STAFF DRAFT VERSION OF H.R. 2743, THE "NATIONAL MATERIALS POLICY ACT OF 1980"

Mr. Chairman, members of the subcommittee, I appreciate the opportunity to testify on the proposed "National Materials Policy Act of 1980." I have worked for the Department of the Interior and the Materials Group of the Congress's Office of Technology Assessment (OTA), focusing primarily on the domestic supply side of materials policy. I was the project director and author of the OTA report, Management of Fuel and Nonfuel Minerals in Federal Land, which was completed and distributed to this and other committees of theCongress in April 1979. I have been asked to include a summary of relevant portions of the OTA report in my testimony today. The summary necessarily will be sketchy and incomplete, since the report is thick and covers many different issues. I also wish to emphasize that my testimony is solely my own and that I do not speak for OTA.

Apparently, much of the impetus behind, and testimony on, the proposed bill concerns the availability of minerals in land owned by the Federal Government, both onshore and offshore. The OTA report dealt with the availability of minerals in Federal onshore land, exclusive of Indian land. The report concluded, as have many other studies, that onshore land owned by the Federal Government or obtained from the Government by private parties under the Federal mineral laws is one of the more important sources of domestic mineral resources. Federal onshore land now constitutes almost one-third of the nation's onshore land, and the Government will still own over 27 percent of the onshore land after the completion of the Alaska State and Native land selection process. The Federal land is concentrated in the areas of the nation considered to be most favorable for the occurrence of economic mineralization. Most domestic nonfuel mineral production has come from Federal land areas, which contain the bulk of the known domestic resources of a majority of the metallic minerals. They also contain major resources of coal, oil shale, geothermal steam and uranium, in addition to proportionately smaller, but nevertheless significant, resources of oil and gas. (Much larger resources of oil and gas may be found in Federal offshore land.)

The OTA report identified three major areas of concern with respect to exploration, development and production of the mineral resources in Federal onshore land: (1) impediments to efficient mineral activities, considered solely from a mineral production perspective, posed by the existing collection of Federal mineral laws, (2) problems in reconciling mineral activities with nonmineral activities and values, and (3) problems of interagency and intergovernmental cooperation and coordination.

I shall summarize the first area of concern very quickly, since I believe the committee will find the second and third areas more directly relevant to the discussions on the proposed bill. In brief, OTA found that the existing Federal onshore mineral laws, enacted over more than a century, are a patchwork that has significant gaps in coverage, treats physically similar lands or mineral deposits differently, and impedes multiple-mineral exploration, development and production. Access to Federal land for mineral activity is uncertain under each of the mineral laws. Even after access has been obtained, tenure for exploration is highly insecure under the Mining Law, and tenure for development and production is uncertain for all minerals under the Mining Law and for nonfuel minerals under the mineral leasing laws. Tenure lengths and conditions, on the one hand, force unnecessary and inefficient work, and yet, on the other hand, are insufficient in themselves to assure diligent exploration and development or proper conservation of mineral resources. I refer you to chapter 4 of the OTA report for a detailed discussion of these and related issues.

The second area of concern--reconciling mineral activities with nonmineral activities and values--has been a subject of considerable debate for the past several years and is the focus of chapter 5 and appendix B of the OTA report. The debate has centered on the withdrawal of large amounts of Federal land from availability for mineral activity.

A few figures should help to put the issue in perspective. OTA, after a fairly careful and thorough analysis, estimated that, in 1975, 34 percent of the total Federal onshore land (both public domain and acquired) was formally withdrawn from hardrock mineral activity and 39 percent was formally withdrawn from nonhardrock mineral activity. (Land was counted as withdrawn only if it was not available under any legal arrangement--e.g., Mining Law, special Federal leasing law, State mineral law, Alaskan Native contract, etc.) In addition to the land formally withdrawn, an estimated 6 percent of the total Federal land was highly restricted for hardrock mineral activity and 10 percent was highly restricted for nonhardrock mineral activity in 1975. (The "highly restricted" classification included land which, while formally open to mineral activity, was restricted by statutory or administrative conditions to such an extent that mineral activity was greatly discouraged, although it sometimes did occur.) The 120 million acres subsequently withdrawn in late 1978 by the Executive Branch for national conservation systems in Alaska almost entirely overlapped already existing withdrawals. They were estimated to have resulted in closure of an additional 1.6 percent of Federal land to nonhardrock mineral activity and in no net increase of Federal land closed to hardrock mineral activity. The OTA report did not assess the affects of the RARE II and BLM wilderness inventory programs, which were initiated too late to be included in the OTA calculations. However, it has been reported that 36 million of the 62 million RARE II acres and 124 million of the 174 million BLM wilderness inventory acres have already been dropped from further consideration for wilderness, and a significant portion of the remaining inventory areas were probably part of the earlier RARE I process or were BLM primitive or natural areas, so that the net increase in closed or highly restricted land due to these programs is currently

probably no more than 7 to 9 percent. If this is the case, then about 55 to 60 percent of the total Federal onshore land is now closed or highly restricted for nonhardrock mineral activity, and about 45 to 50 percent is closed or highly restricted for hardrock mineral acitivity.

These nationwide withdrawal/restriction figures, however, still do not provide a true general picture, since they are seriously distorted by the extensive Alaska land transfer and designation process. In 1975, about 45 percent of all Federal onshore land was in Alaska, and almost all of the Federal land in Alaska was withdrawn from any activity under the Federal mineral laws to permit orderly selection and transfer of approximately 150 million acres to the State of Alaska and the Alaskan Natives and designation of major additions to the Federal national conservation systems. (Much of the State and Native-selected land, however, was available for hardrock mineral activity-- and some was available for nonhardrock mineral activity--under State mineral laws or agreements with the Natives.) As table 1 shows, only 24 percent of the Federal onshore land in the Lower 48 States was closed or highly restricted for nonhardrock mineral activity in 1975, and only 26 percent was closed or highly restricted for hardrock mineral activity. The currently remaining RARE II and BLM wilderness inventory areas might add 10 to 15 percent more to the highly restricted category for both hardrock and nonhardrock minerals, so that about 35 to 40 percent of Federal land in the Lower 48 States is probably either closed or highly restricted for mineral activity at the present time. These percentages may decrease to 33 percent or less when all steps of the wilderness review process, including Congressional consideration, are completed.

TABLE 1
AVAILABILITY OF FEDERAL ONSHORE LAND FOR MINERAL ACTIVITY IN 1975

	Formally Closed	Highly Restricted	Moderate or Slight Restrictions
Lower 48 States			
Nonhardrock Activity	11.9%	12.4%	75.7%
Hardrock Activity			
Under Any Law	16.2%	9.5%	74.3%
Under Mining Law	23.1%	8.8%	68.1%
Lower 48 and Alaska			
Nonhardrock Activity	39.0%	9.9%	51.1%
Hardrock Activity			
Under Any Law	33.9%	6.1%	60.0%
Under Mining Law	48.6%	5.6%	45.8%

Source: Based on data in Office of Technology Assessment, U.S. Congress, Management of Fuel and Nonfuel Minerals in Federal Land, pp. 215-218 and app. B (1979).

How significant are these withdrawn and restricted areas as possible sources of mineral production? No one can really say. Many of them are now military bases, or qualify for wilderness consideration, precisely because they have historically been considered to be poor mineral prospects, and thus have not been developed. But new exploration and production concepts and techniques might "produce" economic mineral deposits where previously none were believed to exist. The only way to find out, short of government exploration, is to open the areas up for private exploration.

This poses a fundamental dilemma for the Federal land manager, or Congress itself as the ultimate decisionmaker. The OTA report found that, under the Mining Law as written and the mineral leasing laws as administered, mineral rights, once acquired, can override all nonmineral resource values, regardless of the relative weight of the mineral and nonmineral values. The absolute preference given to mineral activities is clearly recognized in the Forest Service surface management regulations and the proposed BLM regulations applicable to activities under the Mining Law, which emphasize that the land manager's authority under the law is limited to requiring mitigation of unnecessary sruface impacts. Moreover, once a valuable mineral deposit has been discovered under the Mining Law, the miner is entitled to obtain a patent which conveys full title to the surface as well as the subsurface from the Government to the miner, so that the Government can no longer even require mitigation of surface impacts, but rather faces further possible disruption of land use planning and management on the surrounding Federal land as a result of the private inholding.

In sum, when land is withdrawn from mineral activity, the resulting multiple use management is exclusive of mineral uses. But, under the current mineral laws, when the withdrawal is revoked to allow mineral uses to be part of the multiple use mix, the mineral uses immediately subordinate and overwhelm all nonmineral uses, no matter how valuable the latter might be, as soon as mineral rights are initiated. Multiple nonmineral use is replaced by a single mineral use.

There is an especially high potential for undesirable preemption of nonmineral resource uses under the Mining Law, since mineral rights are acquired under that law by simply staking a claim. As Thomas Walthier, a mining industry official, recently wrote:

> The bureaucracy can't obstruct, hinder or deny the right to stake a claim. The decision rests entirely in the private sector. The bureaucracy can't stop, or delay, the right to explore (except recent restrictions under some environmental and land use laws), or finally they don't have a say whether or when mining can begin. (American Mining Congress Journal, Feb. 1980, at 74, 87).

Since withdrawals are the only means of controlling entries under the Mining Law, whereas entries under the mineral leasing laws can be controlled more flexibly through approval or rejection of individual applications or incorporation of strict conditions into the lease, it might be expected that, ordinarily, withdrawals would be invoked more often against Mining Law activities than against mineral leasing (nonhardrock) activities, and such indeed appears to be the case. Table 1 indicates that almost twice as much acreage in the Lower 48 States was withdrawn in 1975 from hardrock activities under the Mining Law as was withdrawn from nonhardrock (mineral leasing) activities. (Some of the acreage withdrawn from Mining Law activities was open for exploration and development under special hardrock leasing statutes; hence the 16.2 percent figure for hardrock activity under any law.)

Activities under the mining and mineral leasing laws are subject to Federal and State air quality, water quality and other environmental laws of general applicability that sometimes impose stringent requirements for mitigation of certain specific impacts resulting from mineral activity. However, these general environmental laws do not reach the central issue of the proper allocation and use of the tract of land involved and all its mineral and nonmineral resources. Under the current mineral laws, that decision is automatically made in favor of mineral activity if the land is not withdrawn from activities under the Mining Law or if a lease is issued for mineral exploration and development under the mineral leasing laws.

Withdrawals are made to protect many types of nonmineral and even mineral resource uses and values, including administrative sites, dams, military security, water supplies, physical improvements, opportunities for State and Native land selections, cultural resources, scenic vista, wilderness, wildlife habitat, pipelines and oil shale resources. The reason for some of these closures may be the lack of a provision in the mineral laws for compensation for nonmineral facilities or values damaged by mining. That is, even where mining would be the highest and best use of a tract of land, the Federal land agency is not willing to permit mining when no compensation would be paid for the cost of replacing and relocating substantial improvements or natural resource values.

Moreover, the traditional premise that mineral activity is always the most valuable use of a tract of land is increasingly being rejected. The net value of many mineral deposits being discovered today is lower than the net value of deposits worked in the past, due to increasing expenses and decreasing ore quality. At the same time, many nonmineral resources are seen as being at least as limited in physical supply as many mineral resources and, unlike the nonfuel minerals, subject to permanent loss. Other, less unique nonmineral resources are also being valued sufficiently high tha. Congress or a land management agency is not willing to run the risk of their being preempted by a claimant of some fairly common or marginal mineral deposit, and therefore withdraws the area from mineral activity.

Viewed in this light, the substantial withdrawals of Federal land from mineral activity seem to be not the results of a misguided, unbalanced, anti-mineral policy, but rather the consequences of efforts to try to create some sort of balance among mineral and nonmineral uses of Federal land. Until about twenty years ago, there were few withdrawals and mineral patents and leases were granted routinely with little thought given to the effect on nonmineral resource values. In recent years, there has been more appreciation of and demand for the nonmineral resource values of Federal land. The lack of provisions in the mineral laws themselves adequate to ensure proper balancing of mineral and nonmineral resource values has led to the use of the withdrawal power to protect various important nonmineral resource values. The so-called "withdrawal problem" is thus not likely to abate until additions or adjustments are made to the mining and mineral leasing laws themselves to satisfy concerns about nonmineral resource values. A fuller discussion of the issues and options is contained in chapter 5 of the OTA report.

The third and final major area of concern addressed by the OTA report (in chapter 6) encompasses problems of interagency and intergovernmental cooperation and coordination. In the interest of brevity, I will touch on only a few of the issues. OTA found that the traditional separation of mineral resource disposal and management from multiple-use management of nonmineral resources under the Federal land laws (which has led, among other things, to the withdrawal problem discussed above) has been carried over into the administration of the mineral laws themselves, with adverse effects on efficient, integrated management of Federal resources.

For example, the mineral leasing function entrusted to the Department of the Interior has itself been split into mineral (economic and engineering) aspects and nonmineral (surface impacts) aspects, with responsibility for mineral aspects given to the USGS and responsibility for nonmineral aspects given to the BLM. (The new Office of Surface Mining has a significant role in both the mineral and nonmineral aspects of coal mining operations.) Because minerals are bound up in the land, mineral-related issues invariably affect nonmineral resources, and nonmineral-related issues usually impact mineral resource development. The attempted formal distinction between "economic" (mineral-related) and "multiple-use" (nonmineral-related) aspects of mineral management itself quickly breaks down in practice, causing substantial coordination problems and preventing integrated management of Federal land resources. Thus, USGS and BLM have increasingly moved to joint responsibility for many aspects of mineral leasing on land under BLM's jurisdiction, despite the formally mandated separation of functions. Unfortunately, however, during the creation of the Department of Energy (DOE) by a new and inexperienced Administration, the artificial distinction between "economic" and "multiple-use land management" aspects of fuel mineral leasing was incorporated in the DOE Organization Act, which transferred the economic aspects from the Department of the Interior to DOE. Now, two separate departments, rather than two agencies in the same department, must contend with this distinction and its adverse consequences for integrated land management.

It seems to me that a significant potential for even more serious coordination problems would be created by the proposed National Materials Policy Act of 1980, since it essentially directs the Department of Commerce to undertake a series of activities that are already the responsibility of the Department of the Interior, and which depend for their performance on the resources of Interior agencies such as the Bureau of Mines, the USGS and the BLM. Better results might be obtained by focusing on Interior's performance of its responsibilities, rather than saddling the Department of Commerce with a duplicate of the vaguely worded Mining and Minerals Policy Act of 1970.

BENJAMIN N. CARDOZO SCHOOL OF LAW,
YESHIVA UNIVERSITY,
New York, N.Y., September 24, 1980.

THOMAS L. LAUGHLIN,
Professional Staff, Committee on Energy and Natural Resources, U.S. Senate, Washington, D.C.

DEAR TOM: At the conclusion of the hearing on July 29, you requested that I respond in writing to two questions for the committee.

The second question asked whether OTA had, or I could, estimate any "minimum" level of withdrawals—"lands on which mineral development is not likely or desirable in the foreseeable future." The answer, in brief, is no. Since minerals are hidden beneath the surface, and mineral technology and uses change, few if any areas can be written off permanently as lacking any mineral value. The issue then becomes how important are the surface resources that might be disturbed or lost by mining. Although there are clearly some Federal lands where mineral development is highly unlikely in the foreseeable future because of unique surface values—e.g., the White House, the Capitol, Mesa Verde cliff dwellings, Yosemite Valley—mineral development is always a theoretical possibility even in those areas given extremely high mineral values and an extremely compelling need for the minerals. In other areas, such as the Yellowstone back country, mineral development might be reasonable given very high mineral values even absent a compelling need, assuming proper restrictions were imposed to safeguard critical surface resources. The problem now is that there are insufficient procedures under the mineral leasing laws and insufficient authority under the Mining Law for imposing such safeguards. In the absence of appropriate safeguards, the only method left to Congress and the Executive for protecting important surface resources is withdrawal of the land containing those resources from mineral activity.

The first question asked what the principal reasons for withdrawal from leasing (rather than entries under the Mining Law) are. As is indicated above, the principal reasons are the same as under the Mining Law: a belief on the part of Congress, the Executive and a substantial part of the public that the existing mineral laws and regulations do not adequately provide for protection, restoration or replacement of important nonmineral resource values disturbed by mineral activities. The primary differences between the situation under the Mining Law and that under the leasing laws are that (1) entries under the leasing laws require prior permission from the Federal land manager while entries under the Mining Law do not and (2) the Federal land manager has little if any legal authority to control the mineral activities under the Mining Law to prevent (rather than just mitigate) damage to surface resources, whereas the mineral leasing laws apparently provide adequate authority. Thus, withdrawals are the only assured means of protecting surface resources under the Mining Law, while protection under the leasing laws can be provided instead by decisions on whether to issue or deny individual leases or by incorporating strict surface protection requirements into leases. Why, then, do withdrawals continue to be made under the leasing laws? Some have been made to protect State and Native land selection rights. A substantial number apparently reflect the belief that mineral activity, no matter how strictly limited and controlled, would still be incompatible with extremely important nonmineral resource values. The remainder reflect the fact that the plenary authority under the leasing laws to balance mineral and nonmineral resource values has not yet been translated into procedures and regulations that effectively and assuredly accomplish such balancing. Until this difficult task is fully accomplished, withdrawals often remain the only certain safeguard. Thus, withdrawals from leasing continue to be made, although at only about half the rate that withdrawals from entries under the Mining Law are made.

An extended discussion of the problems of coordinating mineral and nonmineral resource activities and values under the mining and mineral leasing laws is contained in chapter 5 of the OTA report.

Sincerely,

RICHARD W. WRIGHT,
Associate Professor of Law.

Senator FORD. I will recess the committee hearing until Thursday morning at 10 o'clock, at which time Senator Melcher will hold that hearing.

[Whereupon, at 12:50 p.m., the hearing was recessed, to reconvene Thursday, July 31, 1980.]

MATERIALS POLICY, RESEARCH, AND DEVELOPMENT ACT

THURSDAY, JULY 31, 1980

U.S. SENATE,
SUBCOMMITTEE ON ENERGY RESOURCES
AND MATERIALS PRODUCTION,
OF THE COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, D.C.

The subcommittee met, pursuant to recess, at 10 a.m., in room 3110, Dirksen Office Building, Hon. John Melcher, presiding.

Present: Senator Melcher

Also present: Thomas L. Laughlin, professional staff member.

OPENING STATEMENT OF HON. JOHN MELCHER, A U.S. SENATOR FROM THE STATE OF MONTANA

Senator MELCHER. The subcommittee will come to order. Today's hearing is the second and last hearing on the National Materials Policy Act of 1980.

The primary interest of this subcommittee in H.R. 2743 is its impact on national minerals policy questions, an area of traditional concern to this committee. Several aspects of this policy were discussed at the subcommittee hearings on the 29th, including Federal land withdrawal, recycling, security of foreign supplies, and research and development.

Today's hearing will continue examination of the withdrawal issue. In addition, the subcommittee expects testimony on the implementation of the Mining and Mineral Policy Act of 1970 and the Federal Land Policy and Management Act.

Witnesses include representatives of both the mineral producing and mineral using industries, as well as a spokesman for the environmental community.

The first witness this morning is the Honorable Charles P. Eddy, the Deputy Assistant Secretary, Energy and Minerals, from the Department of the Interior.

STATEMENT OF CHARLES P. EDDY, DEPUTY ASSISTANT SECRETARY, ENERGY AND MINERALS, DEPARTMENT OF THE INTERIOR, ACCOMPANIED BY ED HASTEY, ASSOCIATE DIRECTOR, BUREAU OF LAND MANAGEMENT, DEPARTMENT OF THE INTERIOR; CHARLES KENAHAN AND DR. HERMANN ENZER, DEPUTY DIRECTORS OF THE U.S. BUREAU OF MINES

Mr. EDDY. Thank you very much, Mr. Chairman. I appreciate the opportunity to be here today to discuss the current version of H.R. 2743, which is the Senate Commerce Committee staff draft entitled "National Materials Policy Act of 1980."

I have with me today several department officials to assist with any questioning that might come up—the Associate Director of the Bureau of Land Management, Mr. Edward Hastey, and the two Deputy Directors of the U.S. Bureau of Mines, Mr. Charles Kenahan and Dr. Hermann Enzer.

With your permission, Mr. Chairman, I will summarize the key aspects of my testimony as it is rather lengthy.

Senator MELCHER. We are going to make your entire statement part of the record, but we would appreciate it if you would summarize it.

Mr. EDDY. I would like to first emphasize our concern with the issues which this bill attempts to address. The availability and price of many basic commodities is a concern that is underlying a number of recent studies, policy reviews and various legislative efforts. We have recently concluded our review of Federal nonfuel minerals policy, and I will return to that shortly to discuss several of the actions that are being taken to follow up that particular exercise.

I do believe that there is a fundamental question posed by the bill that you are considering today, and that is whether we should attempt to deal in a single comprehensive framework with all of the numerous policy issues that relate to materials policy.

The wide scope and the vast institutional pervasiveness of mineral policy issues we believe would likely render this bill meaningless, and I will discuss briefly some of the issues that relate to its utility.

In conducting the multi-agency nonfuel minerals policy review, emphasizing that minerals, of course, are only one part of materials as addressed in this bill, we learned that a single, comprehensive approach to even a limited number of minerals issues is unworkable. The issues are simply too diverse, and with the responsibility for all materials issues scattered throughout the executive branch, in fact resting in some respect in virtually all agencies, attempting to effect a sweeping policy of this type through any single institutional approach does not appear to us to be realistic.

For example, in looking at minerals problems, clearly the problems and the appropriate policies that affect those minerals that we produce domestically and that are domestically plentiful are likely to be vastly different from those that affect minerals that are obtained from abroad of which we have limited or no domestic supplies, and which may be vital to our national security.

We believe that for policy purposes, these differences are crucial, and if a single policy framework such as envisioned by this bill is to be applied to all materials, we believe that it is going to be so broad as to be ineffective.

Conversely, a policy that is specific enough to affect one type of commodity or a group of similar commodities is not going to apply to others. This is not to suggest in any way that the Federal Government should not address these issues more systematically than it has in the past. We believe that it should.

We believe first, though, that any legislation ought to recognize the existing policy responsibilities of the Federal agencies concerned with nonfuel minerals, in particular those numerous responsibilities of the Interior Department, those in the Commerce

Department, food related concerns in the Agriculture Department, and energy in the Department of Energy.

We should not try in any way to restructure the Federal Government or try to assign responsibility to a single agency to address these concerns.

We also believe that materials policies, be they energy, nonfuel minerals, or agriculture, should in effect be developed from the bottom up, that is, rather than dealing with broad policy statements, we should first attempt to address the needs based on specific commodities, establish priorities, and establish policy objectives for commodities or groups of commodities with common characteristics.

We are attempting to do this now as the first major followup to what took place in the nonfuel minerals policy review. This review for the first time has focused high-level attention on an area of critical concern, the potential United States vulnerability to interruptions of the supply of certain critical minerals from abroad.

This issue is now under close scrutiny by the National Security Council, Interior, along with the State Department, the Defense Department, and the Commerce Department, CIA, FEMA, and others are participating in this effort.

This study has the objective of evaluating the importance of these materials, and the possible changes in government policies that may be needed to reduce our dependency and to prepare us for supply interruptions should they occur. We anticipate having this evaluation completed and policy options available for Presidential consideration well before the end of the year.

Another major concern that was addressed in the nonfuel minerals policy review, and I know one that is of great interest to the committee, has to do with the Federal lands as the domestic source of nonfuel minerals.

While the mineral potential of the lands owned by the Federal Government has not been fully determined, it is thought to be very substantial. A considerable portion of several key domestic commodities are obtained from former and present Federal lands. Various changes in international mineral markets, growing industrialization both in this country and around the world have combined in recent years to place additional demands on the public lands as potential sources of minerals, at the same time that the other values of these lands have been receiving prominent attention and gaining in importance.

It is a concern of a number of people that in the very difficult process of weighing and balancing these competing demands on the public lands that minerals are not given sufficient attention. Many had hoped that a national materials policy would somehow give greater weight to minerals as Federal land use plans and decisions are made.

This is an important question, and I did want briefly to review some of the major mineral related activities in Interior that represent this concern, and particularly the ways in which minerals are considered.

In touching on these, I will attempt to answer several of the questions that the committee posed in its letter to Secretary Andrus.

68-104 O—80——12

A fundamental question, of course, is the extent to which Federal lands are available for nonfuel mineral exploration and development. The Federal Land Policy and Management Act requires a review of lands for mineral entry to determine whether they should be reopened. BLM has recently completed its inventory of withdrawals in the 11 Western States that contain nearly all of the Federal lands in the United States.

The results of this review show that of the roughly 340 million acres of public domain lands considered in these States, 54 million or about 16 percent are currently withdrawn from mineral entry.

Once this review is completed which we expect will be well before the congressionally established deadline of 1991, and the recommendations acted upon, this number will be smaller as those lands which are no longer needed for the current withdrawals are returned to mineral entry.

If we add all of the national park and trail lands, wild and scenic rivers, Fish and Wildlife Service lands, wilderness and wilderness study areas, it turns out that just under one-third of the public domain lands are currently out of bounds for mining.

However, the actual level of mineral activity that has taken place on these lands is more important than the amount of lands that are open. This is an extremely difficult piece of analysis to undertake, and doing the mineral policy review, we attempted to solicit from industry and from other sources data that could lead us to conclusions on the level of exploration on the public lands.

Our best assessment was that about 60 to 90 percent of the roughly $200 million spent on nonfuel mineral exploration of the United States during 1977 which was the latest year for which we could get statistics together, was spent on Federal lands in the West.

This would indicate that we still have a vigorous level of mineral exploration on Federal public lands.

We do believe the system can be improved. As long as the basic authority for hard rock mining is the 1872 mining law, we believe that we will continue to have the kind of conflicts that have resulted in significant withdrawals in the past. We believe that modernization of the mining law of 1872 must be a fundamental element both of improved public lands policy——

Senator MELCHER. I want to interrupt you right here. Your testimony is a little confusing right in this area. You say there are 54 million acres of public land withdrawn from mineral entry? Is that correct?

Mr. EDDY. Yes, sir.

Senator MELCHER. You have identified that much?

Mr. EDDY. Yes; these are mineral withdrawals, specific withdrawals, identified in the BLM inventory.

Senator MELCHER. All right. You have identified 54 million acres that has been withdrawn. What are those 54 million?

Mr. EDDY. These have been withdrawn for a number of purposes.

Senator MELCHER. First of all, they are not in Alaska?

Mr. EDDY. These are the lower 48 conterminous United States, yes, sir.

Senator MELCHER. So what has been withdrawn in the 54 million acres? That's quite a bit.

Mr. EDDY. Yes.

Senator MELCHER. None of this is wilderness?

Mr. EDDY. No; this is not wilderness. Military reservations are one of the dominant withdrawals, water and power sites.

Senator MELCHER. Military withdrawals?

Mr. EDDY. Yes; this includes military withdrawals.

Senator MELCHER. Has the BLM figured out what those military withdrawals are, have they identified them yet?

Mr. EDDY. That is the next step in the withdrawal review. The inventory is the first step. The second step is the process of identifying the specific withdrawals, the purposes for which they are used, and then making the determination of whether these withdrawals are still necessary or whether they should be reopened to mineral entry.

Senator MELCHER. I want to be sure I understand. BLM has identified 54 million acres of public land where somebody, some Secretary of Interior or some President, some Secretary of Defense—has a Secretary of Defense ever made a withdrawal from public lands? How weird is this?

Mr. EDDY. I will doublecheck on this, but the withdrawals are made by the Secretary of Interior, but they are withdrawals for a series of designated purposes such as military reservations.

Senator MELCHER. Could the CIA or its predecessor act as the Secretary of Interior to make a withdrawal as weird as that?

Mr. EDDY. No.

Senator MELCHER. But you wouldn't be surprised. This has been a mystery of why 54 million acres has been withdrawn. We are not talking about wilderness, are not talking about national parks, are we? We are not talking about wild and scenic rivers because they are all not part of this 54 million acres, are they?

Mr. EDDY. No. These are strictly public domain lands under the Pickett Act or other similar withdrawals.

Senator MELCHER. I think it has been abused, and that is why we put that in FLPMA. I think it has been obviously abused, and it is a mystery why some of these withdrawals are made. It is still a mystery to me what difference there is in the bomb range we used in World War II. Is it that bad?

Mr. EDDY. I think there are probably going to be a number of areas that should be reopened. I can't tell you specifically at this point how many, but some of these are substantial. Some of the old Atomic Energy Commission withdrawals are very substantial.

Senator MELCHER. As a matter of fact, once a withdrawal is made, it is sort of put in limbo and ignored from then on within the Department of Interior, is it not?

Mr. EDDY. We have absolutely no quarrel with what Congress directed us to do. It is a good provision and needs to be done. We believe it can be done before the deadline that you established. It is getting priority review with BLM.

Senator MELCHER. I don't know why we made it that long, but the BLM and the Department of Interior argued loud and strong that we make it that way.

Mr. EDDY. Let me ask Ed Hastey to give you more detail on that.

Senator MELCHER. It is an interesting point, if he can clear up part of the mystery.

Mr. HASTEY. Good morning.

Senator MELCHER. Would you give your name?

Mr. HASTEY. I am Ed Hastey. I am Associate Director of the Bureau of Land Management. The withdrawals we have identified total 56 million acres. I might describe some of the withdrawals that make up that 56 million acres. There are some fairly significant withdrawals such as the roughly 22 million acres that are withdrawn to protect other minerals such as coal and phosphate. We also have about 8 million acres of oil shale lands that are in that 56 million acres, withdrawn to protect them from mining claims over the oil shale program.

We plan to initiate action to revoke the 22 million acres as soon as possible. Discussions have been held with our solicitor as to the manner in which to proceed.

We don't want to clear all of the 8 million acres of oil shale lands, but there may be some low value oil shale lands we could open up for mineral entry, and that is something we are working out with Geological Survey.

Senator MELCHER. When there is withdrawal from mineral entry, it is just that. You might be looking at oil shale or shale may be converted to oil, but it also means you couldn't drill an oil well if they wanted to?

Mr. HASTEY. What I was talking about there was hard rock minerals, not leaseable minerals. We want to protect the oil shale lands from the nondiscretionary actions in connection mining claims on those oil shale lands.

We do feel there is probably a sizable amount of that 8 million acres, that are low value oil shale lands and that are not economically worthwhile to develop for oil shale. If that is the case, those might well be opened up for mineral entry.

Senator MELCHER. In the 54 million acres that has been withdrawn for mineral entry, some of that is under the 1872 act?

Mr. HASTEY. Right.

Senator MELCHER. Some of it is both under the 1872 act and the 1920 act, is that right, the Mineral Leases Act?

Mr. HASTEY. Roughly 17 million acres were withdrawn from both the 1872 mining law and the Mineral Leasing Act.

Senator MELCHER. The act of 1920.

Mr. HASTEY. Yes; and 39 million acres under only the mining law of 1872.

Senator MELCHER. Not both?

Mr. HASTEY. There is some overlap, but the total is 56. You have 56 million acres; there are about 17 million acres of overlap—that is acres withdrawn from both location and leasing. We have completed the inventory and we have identified them by agency, by location. Under the withdrawal review process required by section 204(e) of FLPMA, our next step now will be to prioritize those areas and, in working with the various agencies, to have them justify why the withdrawal is still necessary. Then the Secretary's recommendations, in terms of whether the withdrawal is or is not still required, would come to the President and to Congress.

Senator MELCHER. You say you have got it identified by agency?

Mr. HASTEY. By agency.

Senator MELCHER. How much has the Defense Department got?

Mr. HASTEY. I don't have the total with me.

Senator MELCHER. Army, Navy.

Mr. HASTEY. I have it by State, but the numbers they gave me today didn't have the total. I can give that to you for the record very easily.

Senator MELCHER. I wish you would for the record.

Mr. HASTEY. We have it broken out by State and agency, and I can give you a quick total for the record. OK. It is roughly 14 million acres for the Department of Defense; 8 million acres under Water and Power Resources Service; about 2.2 million acres for the Federal Energy Regulatory Commission; 2 million acres for the Forest Service; and 1.4 million acres for the Nuclear Regulatory Commission. That is the major part of the withdrawals.

Senator MELCHER. What is the 18 million? Did you say 18 million or 14 million for Defense?

Mr. HASTEY. Fourteen million.

Senator MELCHER. Eight million, water and power resources?

Mr. HASTEY. Yes—the Bureau of Reclamation.

Senator MELCHER. Eight million?

Mr. HASTEY. Roughly 8 million, yes, sir.

Senator MELCHER. Why do they need 8 million acres?

Mr. HASTEY. A sizable amount was withdrawn in the southern California area some years back tied to the possibility of water development—ground water. We presently have much of that acreage undergoing review.

Senator MELCHER. All right. There is no desire for mineral entry there, in that area?

Mr. HASTEY. Yes; there is. There is a considerable amount of activity in the desert of southern California. It makes up something roughly in the neighborhood of a $500 million industry in minerals in the desert.

Senator MELCHER. A lot of it is hard rock mining?

Mr. HASTEY. A lot of it is salt, phosphate, molybdenum, and a lot of it, we don't know what the value is. Of course, there is still some gold mining going on.

Senator MELCHER. I'm glad to see you're making progress. Has the solicitor advised us yet how a withdrawal is canceled?

Mr. HASTEY. One question that came up is whether or not those withdrawals over 5,000 acres need to go to Congress for revocation.

Senator MELCHER. That is any futuristic withdrawal, isn't it?

Mr. HASTEY. Our understanding of the intent of the law was that any future withdrawals over 5,000 would go to Congress.

There was some question in the department of whether proposed revocations covered by 204(l) should go to the President and Congress for review in every case.

The preliminary thinking in the department, that I am familiar with, is that revocation actions, voluntarily taken by an agency in its normal operations, may be handled by following our usual procedures for section 204(a) revocations. If an agency does not act voluntarily, then it would be subject to section 204(l) procedures, in which case it would have to be considered not only by the Secretary, but by the President, and by Congress, as well.

Senator MELCHER. We would be the referee in case of disagreement, but you are fairly certain that the Secretary could revoke a withdrawal?

Mr. HASTEY. That is our opinion, as to voluntary revocation without congressional review now. I haven't seen the final departmental decision on that, but that was the discussion that was going on in the department. Our position has been that any voluntary revocation proposed of over 5,000 acres, or for that matter any acreage, that the Secretary decided to revoke, because it was no longer justified could be revoked without congressional review, short of the limitations imposed by law. Of course, when a section 204 withdrawal in excess of 5,000 acres is made, the withdrawal is submitted to Congress for its approval.

Senator MELCHER. I think that was the intent. That is the way I recall it anyway. Anything over 5,000 in the future would have to be scrutinized by Congress and approved.

All right. Thank you very much. I'm sorry to have interrupted you, Secretary Eddy, but I did want to understand that portion of your testimony.

Mr. EDDY. I will cover a few other BLM items so I will ask Mr. Hastey to stay up.

Another critical issue that has been identified in the land use planning process has to do with the availability of minerals information in making land use decisions.

BLM's land use planning process does require information on an area of mineral resources before plans are developed, and they do consider the mineral resource potential at each step in their planning process. As new information becomes available, they update plans to reflect this.

However, there are two critical and perhaps insurmountable problems with mineral information. First, it is extremely costly. Mineral information is generally going to cost more, much more to obtain than information on surface uses. It is personnel intensive.

The second problem is that hiring the type of technical people required to do this type of mineral assessment in the highly competitive situation that exists now for minerals expertise is very difficult.

As a result, we have a situation where minerals information frequently is not on a par with the data that is available on surface resources. Thus it does make planning and management decisions difficult because of the lack of comparability.

This shouldn't be interpreted to say we are not at the present time making the best efforts possible to obtain minerals information. In 1978 the Federal Government spent about $23 million on nonfuel mineral assessment on the public lands. This amounted to about 11 to 15 percent of the total amount spent in all mineral exploration and assessment in the United States during that year, so the Federal Government effort is very substantial.

Extensive programs exist in several areas. The first major area of assessment is the work that is being done to evaluate the mineral potential of Federal lands under study for possible wilderness designation. In addition to the wilderness reviews, major mineral assessments are being undertaken by the Geological Survey as part

of its Alaska mineral resource appraisal program and the coterminous U.S. mineral resource appraisal program.

The goal of both of these is to produce the first comprehensive mineral resource inventory of the United States by the year 2000 through systematic studies of all the mineralized areas of the country.

Another area of major concern that we have efforts underway is in improving our mineral information and our mineral research and development. Our knowledge about our current domestic minerals is extremely important to policy development, as is information about the expected demand for minerals, changes in industry, developments in mineral markets, so forth.

The mineral policy review as did other studies found problems with this process, and in particular we found that mineral data and analysis could benefit from certain improvements.

As a result of this, we are taking several steps to improve minerals data. We will be starting a major interagency effort under the U.S. Bureau of Mines to, for the first time, provide a coordinated Federal approach to nonfuel minerals gathering and presentation. We have upgraded the budget in this regard to take these steps this year, and we have also reorganized the Bureau of Mines to create a new single directorate with responsibilities for data and policy analysis.

We believe these efforts are far more likely to meet mineral information needs of Congress and the executive branch than the requirements that are currently specified in the bill you are considering today.

Further efforts are underway in the research and development area to make sure that the Government R. & D. programs are adequately supported and properly focused.

Dr. Frank Press, Director of the Office of Science and Technology Policy, has recently reinstituted the Committee on Materials, COMAT, of the Federal Coordinating Council on Science, Engineering and Technology. This interagency policy level committee will provide an important mechanism for determining materials, R. & D. needs and priorities.

In Interior a whole range of efforts are underway beyond those that I have touched on today, and these are discussed in more detail in my statement.

I would like to reemphasize that we support the purposes evidenced by this bill. I think it should be clear to all of us that the well-being of the country does rest on our ability to deal ably with our needs for materials. This is not an easy task. There are two concerns with the bill that I think would benefit from modification.

First is the absence of a definition of materials. The House-passed version of H.R. 2743 specifically excludes fuels and food, and we would suggest that the problems associated with trying to establish a single, over-ranging policy for all materials would be entirely insurmountable and that we would be better to try to focus this bill on mineral-related concerns, and even more specifically it would benefit if the bill were narrowed to include only strategic minerals,that we focus in on those commodities that are necessary to maintain our national economic well-being and our national security.

We believe by tightening the bill in this respect we can make it workable and more acceptable.

We also have major problems with the attempt in the Commerce Committee staff draft to assign major responsibility to a single department or agency. This is inappropriate. The persuasive nature of nonfuel minerals policy will make it impossible for any one agency or department to claim exclusive responsibility, and we believe that the jurisdictional questions raised by this approach and the necessary increase in staff and budget of one department to provide expertise that exists elsewhere will not guarantee resolution of our concerns.

We don't believe that the solution is in the endowment of one agency with responsibility for which it doesn't have capabilities, but rather in assuring that the President involves the appropriate Federal agencies and offices as related policy and program issues arise.

This is what is occurring in the National Security Council study that I mentioned.

Mr. Chairman, this does conclude my remarks, and I thank you for letting us share these observations with you, and I would be pleased to answer any questions.

Senator MELCHER. Mr. Secretary, I detect that at least on strategic and critical minerals you think we need some sort of a policy bill?

Mr. EDDY. We believe that that is the area of most critical concern. We are now looking at what we believe are the highest priorities in strategic terms.

Senator MELCHER. Now I want to pose a question and see if you have an opinion on it. If you have an opinion, fine. If you don't, I want you to furnish us with the solicitor's opinion.

The question is this—in wilderness review and BLM administered lands, once it has been put in a study category, through that procedure, once it is in the study category, if there hasn't been any activity in drilling for oil and gas in that particular study area, there can be no action taken to drill for oil and gas on that land until after the resolution of the study which is 10 or 11 years, so Congress determines to put it in wilderness or it determines it isn't going to wilderness.

Do you have the solicitor's opinion on that?

Mr. HASTEY. Yes, sir. We have a solicitor's opinion, and we have a whole set of guidelines in terms of the interim management policy that dictates how we handle both the mineral leasing and the hard rock mineral development.

Senator MELCHER. What is the opinion?

Mr. HASTEY. There are various factors involved. One of the factors would be whether you have oil and gas development outside the wilderness study area, but a logical development would be kind of a step in the process, that would be allowed. It also ties to the degradation of wilderness study area.

Senator MELCHER. Ties into what?

Mr. HASTEY. Degradation of the wilderness study area; the intent is that we don't want the areas degraded to a point that they no longer have wilderness characteristics. That is a ruling factor.

Senator MELCHER. There are 59,000 acres in Montana which the Secretary thinks may be a study area. The Wilson basin—I don't know how close it is, if there is any production on the Wilson basin, but let's say within 88 miles of the border there are some gas and oil wells. That doesn't meet what you were describing?

Mr. HASTEY. If there was development right adjacent to it——

Senator MELCHER. That's another point. What is adjacent?

Mr. HASTEY. If you had leases right up on the edge of the wilderness study area.

Senator MELCHER. What if there were leases?

Mr. HASTEY. And they were being developed——

Senator MELCHER. There were leases, but not developed.

Mr. HASTEY. Then we would have to control it under possibly the intent of whether or not you are going to degrade that wilderness area so it no longer would be a study area. If we were going to build roads, that would probably have an impact on the area so it no longer would be a wilderness study area. I have a briefing scheduled this afternoon to get me up to date as to some of the issues there.

Senator MELCHER. I don't think there is anything really close to Bitter Creek, what you described as adjacent which I detect would mean within 2 or 3 miles. You mean contiguous or adjacent?

Mr. HASTEY. Contiguous with the area.

Senator MELCHER. That means right up to the line?

Mr. HASTEY. Right.

Senator MELCHER. When we get to be able to predict the progress of the development of an oilfield, there will be a new day around here, but that is almost impossible.

Mr. HASTEY. The intent is that we insure that these areas, once they are identified as wilderness study areas, are protected.

Senator MELCHER. That's my point. You ought to be careful about identifying them as wilderness study areas since apparently maybe we made a mistake when we passed it, but once that is a study area, there is nothing the Secretary can do to change it, even if the study for 2 or 3 years has absolutely shown that it doesn't have any wilderness qualities and won't be recommended, or that portions of it won't be recommended, so apparently we have got a catch 22 in FLPMA because I don't think the Secretary has any authority to modify the study area after it becomes a study area. Isn't that correct?

Mr. HASTEY. That is correct. Only Congress can make a final decision as to the suitability or unsuitability of that wilderness study area.

I will say one thing. I think we have acted in a responsible manner. We started with 174 million acres.

Senator MELCHER. I get so tired of having figures thrown around. I don't think that means anything. I think each piece of land or each area—you say this is the best use for it. Don't say well, since we have pawed through *x* number of millions of acres we have been very responsible about it. I am talking about being responsible about a specific area.

I don't think masses of figures means anything when you get down to one area.

Mr. HASTEY. It is an indicator I think.

Senator MELCHER. It is an indicator of strenuous endeavor and paper accumulation of figures, but it means nothing to an individual area and that is what we are really coming down to.

I hope you look over that Bitter Creek thing pretty carefully. I have an opinion that it doesn't warrant, or most of it, maybe none of it warrants even any further study, but that is just my opinion, and I recognize there are other viewpoints, but I think we are in kind of a weird position.

The Secretary, after going through that procedure, having designated the study area, then he finds out my goodness, after 2 months or 2 years, my goodness, that old land that was farmed really shouldn't be studied any further for wilderness. It doesn't qualify, he should be able to release it. Now that is apparently how we have locked the Secretary in.

Mr. HASTEY. It will always qualify. The question would be as to whether or not there are higher values on that piece of land than wilderness.

Senator MELCHER. OK. I guess we are saying the same thing.

Mr. HASTEY. I'm sure we are going to have some uncertainty and Congress may decide they are suitable. We are going to have a difference of opinion I'm sure with Congress in some cases.

Senator MELCHER. Congress always has the authority, but it does seem to me that we are, unlike in the forest system review of wilderness, after it left the local forest regional level, they could say look, this isn't quite right, and make a change, that's OK. You can do it and modify the area. Then at the secretarial level another change could be made, an addition, deletion, and then at the Presidential level, but it seems to me under FLPMA once a study area, the 59,000 acres, if that is a study area, if the Secretary or President wants to change it, it is still a study area, all 59,000 acres, until 11 years, 11 or 12 years have elapsed or Congress has acted.

Mr. HASTEY. That is correct.

Senator MELCHER. I'm sorry. I have to leave right now. There are three votes on. We have to recess the hearing for probably 30 minutes, and we will conclude the hearing after that.

I apologize to all the witnesses, but there is nothing we can do about it. The votes are on.

The committee is in recess.

[A brief recess was taken.]

Senator MELCHER. The committee will come to order again. I believe we have adequately questioned the administration witnesses and we will proceed now to our next witness and thank you very much, Mr. Eddy.

Mr. HASTEY. Some of the numbers I gave you earlier are off slightly, the numbers I gave you for the Department of Defense and Water and Power Resources. I can furnish it for the record if you like.

Senator MELCHER. I wish you would. It would be most helpful to us.

[The prepared statement of Mr. Eddy and subsequent information follows:]

STATEMENT OF CHARLES P. EDDY
DEPUTY ASSISTANT SECRETARY OF THE INTERIOR
FOR ENERGY AND MINERALS
BEFORE THE
SENATE SUBCOMMITTEE ON
ENERGY AND NATURAL RESOURCES PRODUCTION
OF THE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
ON H.R. 2743

JULY 31, 1980

Mr. Chairman, members of the Committee, I appreciate the opportunity to appear before you today to discuss the Senate Commerce Committee's staff draft version of H.R. 2743, now titled the "National Materials Policy Act of 1980."

The draft bill you have before you today is evidence of the growing concern about the availability and price of many basic commodities, a concern that has underlain several major studies, policy reviews, and various legislative efforts. This nation's rapid change of fortune with regard to petroleum should have taught us that we must be better prepared to anticipate potential problems with other commodities. As I will point out, this lesson has not been lost. But the fundamental question posed by the bill you are considering today is whether to attempt to deal in a single, comprehensive framework with all materials-related questions. As I stated in my testimony to the Senate Commerce Committee, the answer is clearly no. The wide scope and institutional pervasiveness of materials policy issues would be likely to render this bill meaningless.

As you may be aware, we recently conducted a major review of nonfuel minerals policy issues for the White House. This Cabinet-level review, chaired by Secretary Andrus, was initiated two years ago and examined a wide range of issues related to the continued availability of minerals to the U.S. A number of broad subject areas were examined, extending from overseas supplies of minerals, to public lands, to research and development, and government capability for nonfuel mineral decisionmaking.

The insights gained from the Nonfuel Minerals Policy Review, as well as our day-to-day experience, lead us to believe that the national materials policy proposed by this legislation, while laudable in its vision, is nevertheless destined to disappoint those who hold high hopes for the solutions it seeks to offer. The review taught us that for nonfuel minerals--only a part of the materials you are concerned with--a single policy approach or framework is unworkable.

The issues are simply too diverse. And with responsibilities for materials scattered throughout the Executive Branch--in fact resting in virtually all agencies--attempting to effect such a sweeping policy through any single institutional approach is unrealistic.

At the outset of the Nonfuel Minerals Policy Review, there were some who hoped it would produce a comprehensive nonfuel minerals policy, some single statement that could cover all commodities. As I indicated, we found this to be simply unworkable. We use some 100 nonfuel mineral commodities. Many of them are produced domestically; we are even major world suppliers of some, like phosphate and molybdenum. Other minerals, however, are either domestically scarce or of low-grade, and these we import. Furthermore, our supplies come from many different sources. Clearly, the problems--and the appropriate policies--affecting domestically plentiful minerals are likely to be quite different from those affecting minerals obtained from abroad.

For the Nonfuel Minerals Policy Review, we limited the number of minerals to be studied to 12. But even then we found that the issues, and perhaps more important, their need for government attention varied greatly from mineral to mineral.

For policy purposes, these differences are crucial. If a single policy is to apply to all commodities, it must be extremely broad, so broad that it is likely to be ineffective. Conversely, a policy that is specific enough to affect one type of commodity or group of similar commodities is not going to apply to others.

Further complicating the task of carrying out a materials policy is the diversity of agencies with materials responsibility. For example, more than a dozen departments, agencies, and offices took part in the Nonfuel Minerals Policy Review. Their participation was required because Federal nonfuel minerals policy is, in effect, carried out by many different parts of the government. Any attempt to establish some broad policy on materials must recognize that no single agency within the Federal government has the responsibility and policy capability to deal comprehensively with minerals or materials.

What approach should be taken to addressing Federal materials policies? First, recognize the existing policy responsibilities of Federal agencies: agricultural and forest products in the Department of Agriculture; energy in the Department of Energy; energy and mineral leasing, management, research, and data in Interior, foreign policy related to minerals in State, and so forth. Trying to assign responsibility to a single agency is unrealistic.

Second, recognize that materials policies, be they energy, nonfuel minerals, or agricultural, should be developed from the bottom up. That is, priorities should be established for commodities based on national needs, and policy objectives and programs should be established for individual commodities or groups of commodities with common characteristics. This is what we are doing for energy commodities, and this is what we are now proposing to do as a result of the Nonfuel Minerals Policy Review.

The Minerals Policy Review has focused high-level attention on many of the concerns this draft bill addresses, and many of the steps called for are now being taken. One of the most important of these is a review of U.S. vulnerability to interruptions in the supply of certain critical minerals. This issue is now under close scrutiny by the National Security Council. We, along with the State Department, the Defense Department, the Commerce Department, the Central Intelligence Agency, the Federal Emergency Management Agency, and others are participating in this effort.

Another issue we examined in the Nonfuel Minerals Policy Review, one I am sure is of great interest to this Committee, has to do with the Federal lands as a domestic source of nonfuel minerals. While the mineral potential of the lands owned by the Federal government has not been fully determined, it is nevertheless thought to be substantial. Almost all of the copper and silver, and a considerable portion of the molybdenum produced in the U.S. are obtained from former and present Federal lands.

Mineral industry interest in these lands has also grown in recent years, as foreign holdings were taken over in a wave of nationalization, and companies looked to more secure properties for investment. Rising prices for some commodities and technological advances have also made some formerly subeconomic deposits in the U.S. appear more attractive.

These changes in the international mineral market, along with growing industrialization around the world, have combined to place additional demands on the public lands, at the same time that other values of those lands have gained in importance. The Federal Land Policy and Management Act was, in fact, enacted to provide a rational framework for land use planning in order to cope with the increasing competition among public land users.

It is the concern of some that, in the difficult process of weighing and balancing competing demands, minerals are not given sufficient attention. Indeed, it may be the hope of those who have expressed this concern that a national materials

policy will somehow give greater weight to minerals as Federal land use plans and decisions are made. Because of the importance of this question, it would be worthwhile to review the mineral-related activities of the Interior Department and the ways in which minerals are considered; in doing so, I will attempt to answer the Committee's questions. As I will attempt to point out, the processes may deserve improvements, but these can best be achieved through attention to specific problems, rather than through a statement of broad policy.

The fundamental question, of course, is the extent to which the Federal lands are available for nonfuel mineral exploration and development. As you know, FLPMA requires a review of lands withdrawn from mineral entry to determine whether they should be reopened. The Bureau of Land Management recently completed its inventory of withdrawals in the 11 Western States that contain nearly all of the Federal lands in the conterminous United States. The results show that of the roughly 340 million acres of public domain lands in these States, only 54 million, or 16 percent, are withdrawn from mineral entry. Once the review is completed, which we expect will be well before the Congressionally-set deadline of 1991, and the recommendations acted upon, this number will no doubt be even smaller, as those lands which no longer need to be withdrawn are returned to mineral entry.

Even if one focuses only on the situation today, however, the extent to which public lands are unavailable for hardrock mineral development appears overstated. If one adds all National Park and Trail lands, wild and scenic rivers, Fish and Wildlife Service lands, wilderness areas, and even wilderness study areas, it still turns out that just under one-third of the public domain is out of bounds to mining.

The level of mineral activity that is actually taking place on the public lands is probably more important, however, than simply looking at what is potentially available. Although the data are not very precise, the mining industry has reported that about 60 to 90 percent of the roughly $200 million spent on nonfuel mineral exploration in the U.S. in 1977 was spent on Federal lands in the West. Thus, despite the concerns, the evidence indicates that the Federal lands continue to be vigorously explored.

Certainly the system can be improved. As long as the basic authority for hardrock mining on the public lands, the 1872 Mining Law, makes mining the dominant use, to the possible exclusion of other uses, land managers frequently have no choice but to withdraw lands that could be developed for minerals if greater management discretion were available to assure proper safeguards. We continue to believe that modernizing the Mining Law of 1872 is a fundamental element both of an improved public land policy as well as an improved nonfuel minerals policy.

Another important problem in the land use planning process has to do with mineral information. The BLM land use planning process requires informaion on an area's mineral resources, and the mineral resource potential is considered at every step in the planning process. As new information becomes available, plans are updated to reflect this. But obtaining mineral information is extremely costly, requiring considerable time, money, and personnel, particularly when compared with costs of obtaining surface data. As a result, minerals information is often not on a par with the data on surface resources. For many land planning and management purposes, this lack of comparable information makes it difficult for managers and decisionmakers to compare mineral potential with other competing land use values.

This is not to say that considerable efforts to obtain minerals information are not made. According to the Nonfuel Minerals Policy Review, the Federal government spent about $23 million in FY 1978 on nonfuel minerals assessments on public lands, about 11 to 15 percent of the total spent on exploration in the U.S.

A good deal of this work was to evaluate the mineral potential of Federal lands under study for possible designation as wilderness. As you know, the Wilderness Act and FLPMA each require mineral assessments to accompany recommendations to the Congress on wilderness designation for national forest and BLM lands. A joint effort of the Bureau of Mines and the U.S. Geological Survey, these surveys are intended to establish the overall potential for the ocurrence of mineral resources in prospective wilderness areas.

Between the start of the program in 1965 and the end of 1980, studies will have been completed on about 24 million acres of Forest Service land. About 3 million acres remain to be completed by 1983 under the Wilderness Act, and another 26 million acres are to be evaluated further as a result of RARE II. Although the inventory of BLM lands suitable for wilderness is still underway, our current estimates are that perhaps 12 to 20 million acres of BLM lands may require mineral assessments.

The work involved in these mineral assessments is extensive. All previously known mineralization is examined in detail by the Bureau of Mines, through reviews of records and studies and analysis of samples from mine workings and associated geologic structures. The Geological Survey also conducts studies of the geology, geochemistry, and geophysics of the area. If all these studies indicate significant deposits, minability and metallurgical studies are conducted. And finally, after compiling and interpreting all these studies, some evaluation is made of the mineral reserves and submarginal resources of the area.

These surveys represent our most concerted efforts to bring mineral information to bear on decisions affecting the disposition of Federal lands. Yet even so, the surveys simply establish the mineral character of the lands; they cannot reveal the full extent of mineral resources in the area surveyed.

Nor does this information come cheaply, as I indicated earlier. The Bureau of Mines budget for FY 1980 contains close to $11 million for assessment work. GS's budget for 1980 contains over $9 million. Just in the last 3 years (1978-80) alone we have spent close to $33 million, a considerable sum, to make sure that mineral information is included in the nation's decisions to set aside public lands for wilderness purposes.

In addition to the wilderness reviews, the major mineral assessment efforts are represented by the Geological Survey's Alaska Mineral Resource Appraisal Program (known as AMRAP) and the Conterminous U.S. Mineral Resource Appraisal Program (CUSMAP). The goal of these programs is to produce the first comprehensive mineral resource inventory of the United States through systematic studies of all the mineralized areas of the country, to be carried out by teams of geologists, geochemists, geophysicists, and economic geologists. LANDSAT satellite imagery is routinely used by members of the CUSMAP and AMRAP teams to aid in their work. And where it seems suitable, scientists specializing in remote sensing are assigned to work on selected quadrangles.

Since AMRAP began in 1974, 13 folios have been published or are in press; this year, studies are underway in 9 quadrangles and by the end of next year, 4 additional folios will be completed. Under CUSMAP, which began in 1977, 15 quadrangles are under study; 3 will be completed this year and 6 in 1981. The goal of CUSMAP is to complete the mineral resource assessment of the 125 mineralized quadrangles in the conterminous U.S. by the year 2000. AMRAP hopes to complete the 100 mineralized quadrangles in Alaska by the same date.

Priorities for CUSMAP and AMRAP quadrangles are set on the basis of several factors: the known presence of mineral resources; the potential contribution of the work to other studies such as wilderness surveys or, in Alaska, the presence of D-2 lands; the potential contribution of the expected mineral resources to the nation's minerals position, the availability of personnel knowledgable about the area; and the cost of the surveys in a particular quadrangle (they vary greatly).

Our knowledge about the occurrence of domestic mineral resources is extremely important to Federal nonfuel minerals policy, as is information about expected demand for minerals, changes in an industry, developments in mineral markets, and so on. As did other studies before us, the Nonfuel Minerals Policy Review found problems with the process by which the government develops and formulates policies affecting nonfuel minerals. In particular, we found that mineral data and analysis could benefit from certain improvements.

As a consequence, the Interior Department has taken a number of steps to improve Federal minerals data. An interagency effort under the direction of the Bureau of Mines will for the first time provide a coordinated Federal approach to nonfuel minerals data gathering and presentation. Over $3 million has been proposed for addition to the FY 1981 budget for the Bureau of Mines to improve its mineral data and analyses capabilities. We also have reorganized the Bureau of Mines to create a single new directorate with responsibility for minerals data and analysis. We believe these efforts are far more likely to meet the mineral information needs of Congress and the Executive Branch than the requirements of the materials policy bill under consideration.

By the same token, this bill would do little to enhance research and development related to nonfuel minerals, one of the key objectives of H.R. 2743. The Nonfuel Minerals Policy Review has already identified a number of opportunities where additional research might be able to make significant contributions to some of the mineral problems we face. The tasks now ahead of us are to determine more precisely the kinds of R&D efforts now sponsored, to evaluate the adequacy of these programs, and to develop some priorities for funding.

Advances in technology have provided solutions to many of the problems we face in obtaining and using minerals, and continued support of R&D is essential to our technological progress. To make sure that government R&D programs are adequately supported and properly focused, Dr. Frank Press, Director of the Office of Science and Technology Policy, recently reinstituted the Committee on Materials of the Federal Coordinating Council on Science, Engineering, and Technology. As an interagency policy-level committee, this group provides an important mechanism for determining materials R&D needs and priorities.

This committee is undoubtedly aware that in much of its subject and scope--and even in its language--H.R. 2743 is very similar to the Mining and Minerals Policy Act of 1970. That Act declares it the Federal government's policy "to foster and encourage private enterprise" in:

- The development of sound and stable domestic mineral industries.

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- The orderly and economic development of mineral reserves and resources and reclaimed materials to meet industrial, security, and environmental needs.

- Mineral-related research, including the use and recycling of scrap.

- Development of methods to deal with mineral waste products, and reclamation techniques, in order to reduce environmental impacts associated with mining and processing.

Both fuel and nonfuel minerals are included in the Act's definition of minerals.

The policies established by the Act are quite broad. Because, as I stressed earlier, the functions of many agencies affect minerals, these policies pertain throughout the Federal Government. In addition, the Secretary of the Interior is instructed to carry out the Act's policies, in the course of exercising his authorities under other laws.

Much has happened in the decade since the passage of the Mining and Minerals Policy Act, and activities throughout the Federal Government as well as the Interior Department have furthered considerably the goals of the Act. We now have a separate Department of Energy, and dozens of new laws related to energy and minerals. Government spending for energy programs, particularly for research and development programs, has greatly increased.

Within the Interior Department numerous actions have been taken to carry out the goals of the Mining and Minerals Policy Act. In the last three years alone, we have developed and put into place a new coal management program, a new leasing and regulatory regime for Outer Continental Shelf development, and an entirely new program of surface coal mining reclamation.

The Bureau of Mines and the Geological Survey, all throughout the decade, have carried on extensive scientific and R&D programs in geology, mining, and mineral processing. We have seen a number of important advances in new technologies to improve the health and safety of mine workers. Improvements in the mining and processing of a number of domestically scarce minerals are being realized through concerted research efforts. Information of all types from these exploration, research and data gathering efforts is continually made available to the minerals industries, greatly assisting them in their efforts to provide needed commodities to the economy.

The Secretary has also initiated several programs as a result of the Federal Land Policy and Management Act of 1976. Section 102(A)(12) of FLPMA directs that the public lands be managed in a manner that recognizes the need for domestic sources of minerals from the public lands. Accordingly, as I noted earlier, the Bureau of Land Management is (1) reviewing land withdrawals to determine whether lands withdrawn from mineral entry should be reopened; (2) revising the land use planning and mineral resource inventory systems to ensure better information on which to make multiple-use decisions; (3) conducting multiple-use resource inventories to identify the environmental considerations and using this resource information to make multiple-use decisions; and (4) proposing regulations for hard rock prospecting and mining designed to prevent unnecessary damage to the public lands without unduly interfering with the rights of the miners operating under the Mining Law of 1872.

We are proud of these accomplishments, and we feel they meet fully the objectives of the Mining and Minerals Policy Act. However, I would emphasize that we are able to carry out these activities only because the authority to do so is contained in some other piece of legislation, not the Mining and Minerals Policy Act of 1970. It is these numerous, specific laws, not the general policy statements, that provide the basis for our efforts. For the same reasons, the bill before you is unnecessary, relying as it does on existing authorities to carry out its purpose.

I want to emphasize that we share fully the concerns evidenced in this bill. It should be quite clear to all of us that the well-being of our country rests on our ability to deal ably with our needs for materials. This is certainly not an easy task. But it is made no easier, I am afraid, by the bill before you. I would urge instead that this Committee and the Congress pay close attention to those programs and policies already aiming to satisfy our materials needs and see how they can be made more successful.

Apart from our views on the need for the bill and its utility, we are concerned about several of its features.

We note, for example, the absence of a definition of materials. The House-passed version of H.R. 2743, you recall, specifically excluded fuels and food. I would suggest that the problems associated with trying to establish a single, overarching policy for nonfuel minerals would be entirely insurmountable if such a policy attempted to embrace other kinds of materials as well. Even if the bill were narrowed to include only nonfuel minerals in its purview, I believe it should be further focused on strategic minerals, those necessary to maintain our Nation's economic well-being and security.

We also find the assignment of major responsibility for carrying out the act to one department to be quite inappropriate. Certainly my description of the Interior Department's mineral programs offers some evidence of the extensive role Interior plays in Federal mineral policies. Indeed, as I indicated earlier, because of the pervasive nature of nonfuel minerals policy, no one agency or department can claim exclusive responsibility. Any attempt to perfect government policies must recognize this.

Apart from the jurisdictional questions raised by this bill, increasing the staff and budget of one department to provide the expertise that already exists elsewhere will not guarantee resolution of our concerns about materials. The solution is not in the endowment of one agency with responsibilities for which it has no capability--or more important, no authority--but rather in the assurance that the President involves the appropriate Federal agencies and offices as related policy and program issues arise.

Section 5 of the proposed bill calls for various reports to Congress, including program plans; some of these reporting requirements are ongoing. I note that much of the information that would be provided is already made available to the Congress as departments and agencies appear before appropriation and authorization committees. This section of the bill would thus add very little new information to that which is routinely provided, and would only increase the paperwork burden.

Mr. Chairman, this concludes my remarks. Thank you for allowing me to share my observations with you. I would be pleased to answer any questions.

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STATISTICAL SUMMARY
Acreage of Withdrawn Lands in the 11 Western States
Subject to Withdrawal Review

Of some 347 million acres of public lands in the 11 Western States named in the Federal Land Policy and Management Act (FLPMA), almost 57 million acres are segregated from some form of mineral exploration and development and are subject to withdrawal review under Section 204(1) of FLPMA. A breakdown showing the various types of segregations by State is shown in Table I. Table II shows a breakdown by holding agency by State of the 57 million acres. Please note that not included in these acreage totals are any lands set aside for National Parks, Wildlife Refuges, Wild and Scenic River Systems, and National System of Trails; Indian reservations and other Indian holdings; and National Forests. Such reservations were specifically excluded from withdrawal review under FLPMA.

For this fiscal year (80), BLM is reviewing withdrawals segregated from mineral leasing in the Overthrust Belt. Some 22 withdrawals involving 125,000 acres will be reviewed by October 1, 1980, in BLM and final recommendations sent to the Congress by the President by December 15, 1980. In addition BLM's most recent State Office estimates indicate that some 251 withdrawals will be reviewed during FY 1980 (including the Overthrust Belt withdrawals).

At a recent withdrawal review meeting, BLM officials and holding agency representatives reached an important agreement on the development of a comprehensive 12-year withdrawal review schedule for 204(1) withdrawals. The BLM will furnish each holding agency a listing of all withdrawals to be reviewed through 1991 by October 1, 1980. The agencies, through their own internal coordination mechanisms and through negotiation with BLM, will then furnish a complete schedule for reviews through 1991 to BLM by January 15, 1981.

TABLE I

WITHDRAWN LAND, BY STATES AND EXTENT OF SEGREGATION, UNDER FLPMA AND DEPARTMENTAL REVIEW AUTHORITIES 1/
(To Nearest Thousand Acres)

State	No. WD's	PD Lands	Withdrawn Lands	Mineral Location	Mineral Location & Mineral Leasing	Mineral Leasing	Nonmineral Segregation
Arizona	575	31,795,266	6,844,000	2,440,000	3,622,000	100,000	682,000
California	1,825 2/	43,761,437	20,994,000	4,201,000	2,052,000	6,000	14,735,000
Colorado	706	22,554,825	9,321,000	3,306,000	98,000	0	5,917,000
Idaho	734	32,912,456	11,661,000	647,000	620,000	0	10,394,000
Montana	634	25,225,407	10,240,000	2,222,000	48,000	0	7,970,000
Nevada	335	61,357,030	43,941,000	1,696,000	2,010,000	0	40,235,000
New Mexico	373	24,187,343	19,499,000	4,096,000	2,425,000	250,000	12,728,000
Oregon	954	30,943,046	15,314,000	1,029,000	71,000	0	14,214,000
Utah	515	33,761,890	11,535,000	9,153,000	1,851,000	5,000	526,000
Washington	558	11,033,056	1,095,000	513,000	128,000	0	454,000
Wyoming	576	29,652,155	15,065,000	9,820,000	4,270,000	26,000	949,000
TOTALS	7,785	347,183,911	165,509,000	39,123,000	17,195,000	387,000	108,804,000

1/ Figures in Gross Acreages

2/ See Notes on State Report

TABLE II

Acreage Withdrawn from Operation of the Mineral Public Land Laws
By Holding Agency (millions)

Holding Agency	Dept. of Defense	Forest Service	Dept. of Energy	Water & Power Resources Svc.	Fish & Wildlife	Nuclear Reg. Commission	Indian Affairs	Land Management	Park Service	Other	Total
State											
Arizona	1.6	.2		1.5				.7			6.0
California	2.6	.3	.3	1.3				1.8			6.3
Colorado	.1	.2	.1	.3				2.6		.1	3.4
Idaho	.1	.2		.3		.5		.1		.1	1.3
Montana	.6	.1		.7				.7		.1	2.2
Nevada	.7			1.1		.8		1.1			3.7
New Mexico	2.1	.1		.1			.3	3.9		.3	6.8
Oregon	.1	.4	.1	.1				.3	.1		1.1
Utah	1.8	.1		1.7				7.2		.2	11.0
Washington	.1	.2	.1	.2		.1					.7
Wyoming	.1	.2		1.8				12.0		.1	16.2
Totals	11.9	2.0	.6	9.1		1.4	.3	30.4	.1	.9	56.7

Senator MELCHER. Our next witness is Mr. E. F. Andrews, vice president of materials and services for Allegheny Ludlum Industries from Pittsburgh.

Mr. ANDREWS. Good morning, Mr. Chairman. I have handed to your staff a prepared text which if it is agreeable I will put in the record and I will just speak for a few minutes here, summarizing it.

Senator MELCHER. Yes. Mr. Andrews' entire statement will be made part of the record.

STATEMENT OF E. F. ANDREWS, VICE PRESIDENT, MATERIALS AND SERVICES, ALLEGHENY LUDLUM INDUSTRIES, INC., PITTSBURGH, PA.

Mr. ANDREWS. My name is E. F. Andrews. I am vice president of materials and services for Allegheny Ludlum Industries, and I am a former president of the National Association of Purchasing Management, and former chairman of the Critical Materials Supply Committee of the American Iron and Steel Institute, and I have been asked today to speak on behalf of the American Iron and Steel Institute as well as myself.

I have devoted the last 30 years of my life being concerned with materials problems in this country for my company and have been very pleased to see this issue moving higher on the national agenda.

In the last decade alone we have gone through the National Materials Policy Commission, National Commission on Supplies and Shortages, the current interagency study, and others, yet also in that decade we have also suffered two periods of severe interruptions, shortages, and an extremely runaway crisis of raw materials.

I am not inclined to believe the whole world is running out of everything. It is nothing but minerals and metals. I suppose everything is finite, but that doesn't really bother me. If we will let the system work, as we reach deeper and deeper into the bowels of the Earth to extract less and less ores, the cost to do so will rise, and as the cost rises, the problems will rise. As the price rises, people will decide they are forever running out of something, nobody will be using it anyway, so it is a self-correcting system if you will. Just get out of the way and let it alone.

I am also fully aware that technological breakthroughs will answer many of these problems. Satellite communication reduced the need for copper wire. Frozen food reduced the need for tin for cans, and on and on. Some day I suppose we will be mining the ocean bed and perhaps bringing metals from the Moon.

However, I am not concerned about that time frame that those answers will bail us out of. I am more immediately concerned about what we are going to do in the next few days or years. There are all kinds of shortages. Most of them business is fully prepared to take care of. There are companion shortages. There are supply/demand shortages. These are all business shortages. There is labor interruption shortages. We are used to them. We know how to plan with them. We know how to roll with them.

It is the abrupt interruption over which there is no economic sense, political, military interruptions, that cause us the basic problems. Many of those shortages that we incurred in that period of

time that I referred to we brought upon ourselves. We decided to have shortages by the priorities we choose to pick for ourselves.

Now how do we get at this problem? One of the reasons I think that I was anxious to speak to this bill is I would like to see the bill broadened to be sure and refer to the fact that it is not only a domestic problem. It is an international problem, as we get a growing import dependency of some very strategic and very critical materials that need concern and policy considerations.

Two hundred years ago when we started this country we had all the iron, coal, water, tobacco, and cotton anybody could ask for, and that was all anybody needed. We were virtually self-sufficient. We stood alone.

After World War II when our consumption began to rise to the great and rapid rate, our sophistication of consumption began to rise also, and we found out that we now need chrome, cobalt and nickel and tin and tungsten and manganese of which the United States is virtually totally devoid, and I have submitted a list in the paper that I submitted which gives our import dependency, and it is estimated that by the year 1990, the end of this decade, this country will be more than 50 percent dependent for its entire mineral needs with the balance of payment deficit at today's prices of over $100 billion a year.

Now this didn't even bother us for a long time that we were having to reach to places like Africa to get some of these raw materials. If you needed cobalt, you went to Brussels and dealt with the Belgium Government. They understood things the way we did. They did business the way we did, and they went to their colony, the Belgium Congo, and got the cobalt and sold it to us. We went to the British to get our chrome.

In the past 25 years the process known as decolonization has changed all that, and unfortunately or fortunately as you care to look at it, the rules have changed. As these deposits of raw materials fall more and more into the hands of Third World countries, less developed countries, in many cases, who have a very different nationalism, a very different set of priorities, a very different way of looking at things and doing things, the rules changed.

In like manner those items in this country where we are self-sufficient and have an indigenous supply, we ourselves chose to change the rules because of the priorities we placed on ourselves—our environmental and safety laws, new, highly desirable, unilaterally good, but caused us shortages.

Our tax policies, our wage and price controls, policy after policy that we chose to place on ourselves brought about lack of development or in some cases, actually closing down of operations. Now the need of a coordinated policy I think is best demonstrated by chrome. You look back about 10 years ago. At one time in history we passed a whole set of laws that mandated about a 25 to 30 percent increase in the consumption of coal. Our environmental laws, because you cannot build a clean stream and clean air system without chrome, remembering that we have no chrome in the United States, zero, we passed a law mandating an increase in consumption of 25 percent.

At the same time, we passed a law which shut off 95 percent of where our chrome was coming from. We put an embargo on Rhode-

sia. At the same time, we took the environmental laws and vigorously prosecuted them against the smelting industry which by its nature is an unclean industry, smokey, and therefore shut down about a third of the industry that was processing what chrome we did have.

At the same time, the Commerce Department took the export control of stainless scrap off, the only industrial nation in the world to do so, and every ton of that scrap contained 400 pounds of chrome, so there we set four unilateral policies by the U.S. Government, each flying directly into the face of the other.

Why is chrome important? Without chrome, cobalt, manganese, of which we have none in this country, we can't fly jet airplanes, go build a car, run an automobile, can't run a train, can't build an oil refinery, can't build a nuclear or conventional power station. We can't drill a hole. We are going to have to shut down processing Heinz foods and Campbell's food, close our hospitals unless you want to go to wooden tables and rusty knives.

You say make it out of plastic. No; you can't, because you can't process crude oil without petrochemicals, and without that you can't make plastic. You will shut this country down without this raw material.

Dr. Parker on contingency planning for chrome says he figures it would take us 15 years to design a way for this material. Is there a threat to us? Yes; I believe there is. We are now beginning to hear for the first time in a long time what is known as resource diplomacy. Nigeria said change your policy on Rhodesia or we won't sell you oil.

We are seeing an encroachment of the army of the Russians around the Persian Gulf metals, and also in southern Africa. We see the capability of a country like South Africa to be a cartel almost unto itself on an item like chrome. Out of 3.7 billion tons of reserves of chrome known in the world, 3.6 of them are in Zimbabwe and South Africa, and the State Department and other Government agencies figure that most of the viable deposits in the world will be exhausted by the end of this decade, and we will be standing face to face with one very small part of the world which unto itself will be a cartel.

Germany has declared 11 items as being in politically unstable parts of the world and began to take mineral policies and stockpile planning, as has Japan.

Access to supply is the problem, not adequacy of supply. Therefore, I believe that we need a two-part minerals policy, those of the domestic supply, or as somebody says, the things we have got, and another policy or a second leg of the policy to recover the things we do not have.

This is by no means a call for a national economic planning activity, for history has proved that permitting the free market to work is still our best chance of resolving the problems. As I have said, if we will let the system work, it is almost self-correcting. It is when we step in and impose our priorities on the system that we get in trouble.

I think that policy has to first direct itself to the attention of can we get the adversary relationship between business and Government corrected? I believe that to be a starting place. We must

create a political, economic, and legal climate that encourages investment, exploration and development of resources both in this country and internationally.

I think our policy needs to call for an improvement in our data base. While Secretary Eddy's Bureau of Mines is undoubtedly the world's finest data base of this type of information, it is still inadequate.

A materials policy, a two-pronged policy which would be those things we have and those things we have not—incidentally, I might say here, Mr. Chairman, that I totally agree with Secretary Eddy in saying that this bill should be brought back if you are talking about minerals only. To try to put agricultural products and everything else in there, replaceable raw materials as you call them, presents a broader than necessary aspect to the bill.

Your domestic items under a national minerals policy would, of course, take into consideration conservation, recycling, research, tax policy to stimulate exploration, control of use. Should we be using chrome in every place that we are using it? Free up of land use when necessary, temporary environmental relief when necessary—we can even subsidize, nationalize import/export controls. We have a whole host of instrumentalities that we can call on for those items that we have the control of the supply such as molybdenum, but virtually none of those will work on those items that are not indigenous to this country.

We can't subsidize, declare use, delare export control on those items that we do not control. Therefore, we need a whole new set of different set of policies when we are talking about offshore items. The first one is how in the world do we get the multinational corporation of the United States, from the United States to go into the underdeveloped, less developed and sometimes unfriendly parts of the world?

We have been investing about $1 billion in less developed countries for mineral resource supply over the past decade. It has been estimated that this is going to have to go up by the Bechtel Institute to close to $6 billion annually. What multinational corporation is going to go in and invest $6 billion into an undeveloped country. Even though they need the jobs, they need the investment, they need the taxes, they need the opportunity, we have got the technical skills, we have got the capital, we have got the management skills, we have got the need for the raw material, we sit looking at each other because they say come on in, that's fine, but we want the Government to control the business. We want control of marketing policy. We want control of pricing policy. We want a high percentage of the management to be indigenous people even though they may or may not have the skills.

We sit looking at each other, we in need of the raw material, they in need of the investment, and it isn't going forward.

The lack of technology, the lack of skills, the infrastructure just isn't there. We must overcome how we send multinational corporations into the world. We must set ourselves a policy of establishing some way that we can trade with nations and also carry no implication that we approve or disapprove of their internal policies by injecting moral judgments into our economic decisionmaking.

Americans must be willing and able to avoid ideological confrontations in seeking mutually acceptable pragmatic solutions to our commodity problems. International politics and ideological differences rather than fundamental shortages present to me I believe the biggest problems that we will be facing as they interrupt our supply.

We have got to quit sending the American businessman into an international arena trying to compete with the rest of the Western World for raw materials, trying to operate under a different code of ethics than the rest of the world is willing to live by or accept.

We must examine our antitrust laws because the rest of the world is able to cartel, group, price together, whereas the American businessman runs flat into our own antitrust laws and is again rendered uncompetitive.

When none of these solutions have worked, I have suggested an economic stockpile. Our stockpile is in a mess, and of course technically is not very economic. I think that may be one of the long-term answers for at least two or three items of particular interest.

I believe this bill is not an answer, but I certainly believe that it is a good beginning. If I find fault with it, it is as Secretary Eddy has said. I really don't think you can put the responsibility for it in one Department, the Commerce Department or anything else because the Bureau of Mines, Geological Survey, State Department, OMB, GSA all have to be involved and are important to it.

The important thing is that the one charged must be structured so that it can freely cut across these interagency lines. The bill appropriately demands that the President act. Policy direction must come from there. I have recommended a National Minerals Board in the Office of the President.

However, I don't want to get hung up on the organization. Let's get started and figure that out as we go.

I also, as I have said, agree that the bill should refer to minerals only. I understand there are some who have said that this bill is premature, and others who have said that there is sufficient legislation already in place to handle our problems.

May I suggest that our severe shortage problems of the past decade to me clearly refute these arguments. If the authority is in place, it either didn't work or has gone unused. The shortcomings pointed out by Congress interagency study is further evidence that something is needed. It is time for the Federal Government to address this problem headon, to stop lurching from crisis to crisis. We have been studying the problem through peace and war with commission after commission for the last 30 years.

We have been fortunate enough to have pulled through, but we can no longer depend on such luck. We need to get our act together.

The problem is not adequate supply but access. Commodity agreements, international diplomacy are fine. All of the other efforts, programs by the various agencies that have come before you to speak to this bill are good, but they still failed to solve the problem and to meet the issue headon. We have jumped on our horse and rode off in all directions.

Time is of the essence. The questions are being asked: Are we really in a resource war? If I take Southern Africa alone and hand

that over to the encirclement and encroachment that is now going on, you will be handing over a very, very high percentage of a very, very important group of materials—99 percent of our platinum, 98 percent of the manganese, 95 percent of the chrome, 87 percent of the diamonds and on down the list that is there. I see an encirclement of the Middle East, an encirclement of Southern Africa, of Korea.

Why would they do this? It is low risk. It is low cost. It is low casualty. It is low visibility, and it is below the threshold of response. Nobody is going to activate NATO because we lost Zambia or some place else.

I think this bill could trigger a response to take action. Yes, Mr. Chairman, as one that has been working in the vineyards since 1946 and calling for some kind of a national policy since 1952, I now believe that this is an idea whose time has come. The tradeoffs between social, political and economic considerations are going to be agonizing at times, but if we are to survive, we better do it.

Thank you very much, sir, and if there are any questions, I will be glad to answer them.

Senator MELCHER. There are two points that you have raised. I wonder if you would supply us with recommendations.

The first is on the improved data base. The Government is the agency that is doing most of the collection of this data. I suppose we have to run into some proprietary information that is available for private companies, but we have got to have recommendations on how to improve that data base. We would appreciate it.

The second one, we have got recommendations on investment in less developed nations—how can the U.S. Government act to increase its security?

Mr. ANDREWS. On your data base, it has partially or is starting to be corrected, and Secretary Eddy should speak to this. Up until just a few years ago, not very many years ago, the problem with the Bureau of Mines, our best data base, was that it was in the Department of Interior and therefore it was Interior. It had not a soul outside the Continental United States, and yet the problem for the last 25 years was internationally growing, so it has to be internationalized.

As to protecting the multinational corporation, there are many ways, and the problem with that is each country is different. We have to be able I think to, one, review the international law and its conflict with our antitrust laws, which is a very big bag of worms.

We have to some way or other when we want to go into a country like—let me give you an example of what I am talking about—true story. I was sent into a small country in Africa to look. It was the most poverty stricken place I have ever been in my life—Burundi. They have a lot of nickel deposits. A group of us from Europe and the United States looked at it and figured it could be brought on stream for about $400 million.

Senator MELCHER. I'm sorry. I have to interrupt. I think we better come back at 2 p.m. I'm sorry, but I don't see any other way.

Mr. ANDREWS. Is that all the questions you have of me?

Senator MELCHER. Yes.

[The prepared statement of Mr. Andrews and subsequent information follows:]

STATEMENT OF
MR. E. F. ANDREWS

VICE PRESIDENT
MATERIALS AND SERVICES

ALLEGHENY LUDLUM INDUSTRIES, INC.

Mr. Chairman, my name is E. F. Andrews. I am Vice President of Materials and Services for Allegheny Ludlum Industries, Inc., former national president of the National Association of Purchasing Management, and former chairman of the Critical Materials Supply Committee of the American Iron and Steel Institute. I am still a member of that committee. I do appreciate this opportunity to speak to this extremely important and urgent matter.

I have devoted most of the last 30 years working in and being concerned about the materials supply problems of my company and my country. For many years I have been calling for a national materials policy and a higher profile on this general subject. I believe it is finally beginning to move to the top of the national agenda, and I am very pleased to have it do so. In the past decade, we have gone through the National Materials Policy Commission, National Commission on Supplies and Shortages, and now, the interagency study of the materials problem.

I recognize that there are some authorities who are concerned that we may be consuming basic resources of this world at a faster rate than we should. I do not wish to get into that argument; however, I am one who believes that the world is not really running out of raw materials. It has been said that the first pound of copper ever discovered in this world is probably still here somewhere. Of course, all and everything is finite. If somehow or other, we consume or destroy until there is no place to stand on this planet, then I guess we could say the raw materials are gone. But I do not believe that is within our time frame of thinking. I do not anticipate that we are likely to encounter any serious natural constraints on the existence of raw material, at least in the next 25 to 50 years and possibly 25 decades. In the case of those raw materials that may run out, if there are any, we will merely let the system work as we reach deeper into the bowels of the earth for less yielding ores. Costs will rise. As the cost to extract these materials rises, the price to the consumer will rise. As the price rises, consumers will be forced to design away; and by the time the supply is exhausted, the need for the product will be gone also. It really is a self-correcting system, if we will just let it alone and let it happen.

Let me say further here that I am fully aware that research and technological breakthroughs will also affect the future. Think of what frozen foods did to cut down the need for tin cans; what satellite communications did to cut down the need for copper wire. We could look to the ocean bed or to the moon's surface to bail us out of the long-term and mid-term needs but to count or plan on those things would be, I think, too risky. As I have said, I really do not think any lack of existence of material will constrain us in the immediate future. The problem will be the limits we choose to put on ourselves, our imagination, our will, and our incentives to succeed; the priorities we will choose in our pursuit of a better life for all the people; and our willingness to recognize, coordinate, and manage the materials problem that we will face. I believe this draft bill goes a long way toward meeting this challenge.

While we may not be running out, we have had shortages. What is the problem and how did it get here? From the beginning of this nation 200 years ago, we thought we were absolutely self-contained. We had all the iron, coal, water, cotton, timber, and tobacco we could use--who could ask for anything more? For the first 150 years this was pretty much true, but then, our consumption began to rise at a terrific rate, and the sophistication of that consumption began to change. Whereas we still had iron, coal, cotton, timber, and water, we began to find that to make things we required in this new, modern, sophisticated life, we needed chromium, cobalt, nickel, tin, and tungsten. I believe that the world has plenty of these materials, but God somehow did not see fit to spread them around very well. The United States is virtually import dependent for a long list of those items, as shown in the attached Exhibit 1.

Within the past 25 or so years, the countries that do contain these more sophisticated minerals and metals have changed due to a process known as decolonization. Whereas heretofore we went to Belgium to get cobalt from the Belgium-Congo, we now go to Zaire and deal with a third world country that does indeed have its own nationalism and its own priorities, thus changing the rules of the game.

On those materials that are indigenous to the United States, we began placing on ourselves a set of priorities that deeply affected the availability and use of these materials, such as our environmental and safety regulations. It is because of these changing patterns and the problems they present that I have been calling for a national materials policy.

Chromium presents a good example of why such a policy is needed. The United States has virtually no chromium indigenous to this country. But at the same time, we were in an accelerating, high level of consumption, we passed a group of environmental laws that virtually mandated an additional increase in the consumption of chrome to make the clean air and clean stream equipment and converters on our automobiles. After we had mandated this increase in the consumption of chrome, we then unilaterally, in another part of government, placed an embargo on the importation of chromium from what was then our largest supplier, Rhodesia. At the same time, we applied stricter environmental enforcement on the antiquated ferrochome industry, reducing its productive capabilities. Also at the same time, we allowed unlimited export of stainless steel scrap, each ton of which contained 400 pounds of chrome. Truly, a good example of the need for a coordinated materials policy.

One might ask--what is important about chromium or cobalt? I can do without trim on my automobile or my refrigerator. Well, in today's technology without chromium and cobalt, we could not build a jet engine, build an automobile, run a train, build an oil refinery, or build a nuclear or conventional power station. We could not process food under present laws. We would have to repeal all of our clean air and clean stream laws. We would have to repeal our sanitary hospital codes. We could not build a computer, cutting tool, mine tool, magnet, or process crude oil, just to mention a few things. Chrome is required

in order to carry on our present standard of living and to insure our national security under the technology we have. In fact, the National Research Council, in its 18-month study, ended with a statement by Dr. Parker, of the University of California at Berkley, that the United States is strategically far more vulnerable to a long-term chromium embargo than to an embargo of any other natural resource, including petroleum. In that report, Dr. Parker and his colleagues say that preparing the United States to overcome a chromium embargo will take a minimum of five and possibly up to 15 years.

Is there any threat to the supply of these very critical and strategic materials of which we have virtually no indigenous supply? I believe there is. We are beginning to see the use of resource diplomacy. The Nigerians said that if we changed our policy on Rhodesia concerning chrome, they would stop selling us oil. We have seen cartels formed in the oil business, and I believe that there are several other commodities potentially "cartelable." Look at the southern Africa area and the amount of the world's reserves that are in that part of the world, from Shaba Province in Zaire down through South Africa. I like to call it the Persian Gulf of metals. If that part of the world fell into the hands of unfriendly nations, either by military force or by decision on the part of the Southern Africans to join in a cartel with the Soviet Union, for example, the ability to deny us access would be devastating.

Exhibit 2 shows you the percentage of the world's reserves that would be controlled by such a cartel, if it should come about. The map shows that part of Africa in which the Soviet Union has a high presence through its surrogate army from Cuba, virtually tightening a noose around the Persian Gulf of metals, as they also seem to be doing around the real Persian Gulf that furnishes our vital oil.

A recent study from Germany lists chromium, manganese, cobalt, platinum, and others as being in high risk, politically unstable parts of the world and indicates that they are highly concerned about it. There has been a growing presence of the Soviet Union in the role of a buyer in Africa. One has to wonder if Russia is as self-sufficient in these metals as we have been led to believe. If so, why are they buying--to stockpile or because their own reserves are less viable than we have known them to be in the past? Will they now be competing for material, rather than supplying it as in the past?

Thus, the growing problem is that this small piece of earth known as the United States does indeed have finite reserves of certain very critical and important raw materials--important and critical to the sophisticated society that we now live in. Therefore, our task today, it seems to me, is not only to discuss the adequacy of the supply but, more importantly, access to the supply--access at time of need, not only of foreign supply items but domestic as well.

We no longer can consider this country as a "closed economy," when formulating our natural resources policy--or, in fact, any other. We must improve our knowledge of the state of the world's resources and of how social, political, and economic events that might occur in other nations will affect the flow of those resources to this country. We must also bear in mind that Western Europe and Japan have similar resource deficiencies and, therefore, will be competing with us for a share of available supply.

It is for these and other reasons that I have been calling for a national materials policy--a two-part policy--one for those commodities we have and another for those we have not. This is by no means a call for a national economic planning activity. History has proved that permitting the free market to work is still our best method of resolving our problems. However, since we are operating ever increasingly in a global political marketplace which tends to override the economic marketplace, one can see the need for giving consideration to policies that will help prevent those abrupt and non-economic interruptions that have occurred in the recent past.

With regard to those items in which we are mostly self-sufficient, it seems to me that we must work to change the relationship between government and business in America from an "adversary relationship" to a cooperative relationship. This may well be our most serious deficiency, when compared to other industrial nations. We must create a political, economic, and legal climate that encourages investment, exploration, and development of those resources and facilities that we do have. We must devise a way whereby we can give proper supply impact considerations before passing laws that are unto themselves desirable but, perhaps over the short run, too costly in jobs, inflation, and consumer interruptions, or even risk our national security.

We must improve our data base so that we can have a better understanding of what is available; and we must communicate that information, so that we can prevent the inventory fluctuations which aggravate already serious problems. It is vital that long-run, developing trends in resource and supply, both with regard to this country and the rest of the world, be formally monitored and that the emerging issues bearing upon them be highlighted as far in advance as possible, in order to prevent surprises. The level and quality of such monitoring, particularly with respect to foreign supply, must exceed that now being done.

We must institute conservation, recycling, and research programs that will seek innovative substitutions and better utilization of the materials we do have. We must encourage entrepreneurial incentive. We can change the tax policy to stimulate exploration, control the use, free-up the land use, give temporary environmental relief, subsidize, nationalize, impose export controls--many avenues are open to us on those items over which we have control of our own

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supply and are self-sufficient in that supply, such as molybdenum. However, virtually none of these will work on items over which we do not have control of the supply, such as chromium, cobalt, platinum, manganese, etc. A different set of policies are needed here.

When we examine the problems that face us in those raw materials which we now must obtain offshore, government's role is equally important. Can we reconcile the growing needs of the "multi-national corporation," so necessary to the private enterprise system and its material supply problems, with the forces of nationalism in newly developing nations? The seriousness of our problem of access to future supply is compounded by the fact that demand for minerals and metals is rising at a faster rate now in many of those very countries than it is in our own. As a result, nations of the world are beginning to compete seriously for a rising share of world supply. The less-developed countries are promoting more aggressively their own industrialization and, therefore, are increasingly more sensitive to what they view as "exploitation."

It is true that many of those countries lack the technology to discover, extract, and market their resources. They also mistrust and fear business corporations that do possess the capital, technical and management skills needed. It seems to me that American business and government must join hands to address this problem because, as I travel around the world, I find that the governments and businesses of other industrial nations have cleared this hurdle.

In this day of "instant communication" and fast transportation, Americans must learn to tell their story better. Industry has found a use and a market for the "third world's" raw materials. It has the technology to develop them. In most cases, industry has the capital to provide the infrastructures and plant facilities. It can provide the skilled manpower, and it can provide local citizens with job opportunities. All of this leads to a better life than those local citizens otherwise might expect if left upon their own present technical, capital, and management capabilities. But how to provide all this and still protect the multi-national corporations' investments--which really represent the savings of millions and the pension funding for other millions, here and abroad--is a serious problem yet to be solved.

America must establish normal trade and diplomatic ties with all nations, and these should carry no implication of approval or disapproval of the internal policies of each of these nations. Injecting so-called "moral judgments" into trade, industrial, and investment policies will only lead to bewildering contradictions. Americans must be willing and able to avoid ideological confrontations in seeking mutually acceptable, pragmatic solutions to our commodity problems. It seems to me that international politics and ideological differences, not fundamental shortages, present one of the biggest threats to our access to the world's raw materials. Cobalt, chromium, nickel, to mention a few, give us recent examples of these kinds of interruptions; interruptions caused by policies, not economics. We must devise a way of more closely tying our foreign policies affecting those countries to our peoples' economic best interest. How does the American businessman go into the world marketplace competing for the world's raw materials under a different code of ethics than the rest of the world is willing to recognize or abide by?

When there is no other answer, I have advocated a small national economic stockpile. The purpose of a stockpile is to be a "time buffer"; to give us time to solve the problems of abrupt interruptions that make no economic sense but are political, military, or ideological interruptions.

I believe that this bill is not an answer, but it certainly is a good beginning. It states, "We lack a coherent national minerals policy;" and it is the bill's intent "to pursue measures that assure the availability of critical materials."

If I find fault with the bill, it would be first that I am not sure that the Commerce Department is the proper place to carry out the provisions of this bill. The need for involvement of the Bureau of Mines, Geological Survey, State Department, OMB, GSA, and others are important. The one in charge must be structured so that it can freely cut across interagency lines. The bill properly demands that the President act. Policy direction must come from the top, so perhaps a National Minerals Board,as part of the White House itself, is called for. However, I hope we won't get hung up on organization. Let's get started and let the last section of the draft bill take care of permanent structures. Secondly, I would make it a little clearer that the problem is twofold--international, as well as domestic.

I understand that some have said this bill is premature and others have said that there is sufficient authority already in place to handle the problem. May I suggest that our severe materials problems in the past decade clearly refute those arguments. If the authority is in place, it didn't work or went unused. The shortcomings pointed out by Congress of the recent Interagency Study is further evidence that something more is needed. It is time for the Federal Government to address the problem head-on and to stop lurching from crisis to crisis. We have been studying the problem through peace and war with commission after commission for the last 30 years. We have been fortunate enough to have muddled through, but we can no longer depend upon such luck. We need to get our act together. This bill demands that the President act now. The problem is not adequacy of supply, but access at time of need. Shortages of domestic supply will be determined by our own inadequacies and the restraints we place on ourselves. Shortages of imported materials will be far more complicated and far more dangerous and increasingly beyond our ability to control.

Commodity agreements and international diplomacy are fine. The other efforts and programs enumerated by other agencies that have spoken to this bill are all good but still fail to meet head-on this growing emergency. The problem is not getting solved.

Time is of the essence. The question is being asked: Are we already in a worldwide resource war? A war whose purpose is to render helpless our industrial might. For our enemies, such a war has the attraction of being low cost, low casualty, low visability, and most important, low risk of triggering a response from us. Taking the action suggested today would be such a response.

Yes, Mr. Chairman, as one who has been working in this vineyard since 1946 and calling for a National Materials Policy since the Paley report in 1952, I now believe that it is an idea whose time has come; and what better time to act on the problem than now when we are under no immediate pressures of short supply.

As I have said, this bill is a good beginning. There are going to be trade-offs between social, political, and economic considerations; and those trade-offs will be agonizing at times. But if we are to survive with the secure economic well-being that we all desire, the time for study is past--the time for action is here.

Thank you, Mr. Chairman.

EXHIBIT 1

PERCENTAGE OF U.S.A.'S MINERAL REQUIREMENTS IMPORTED IN 1978

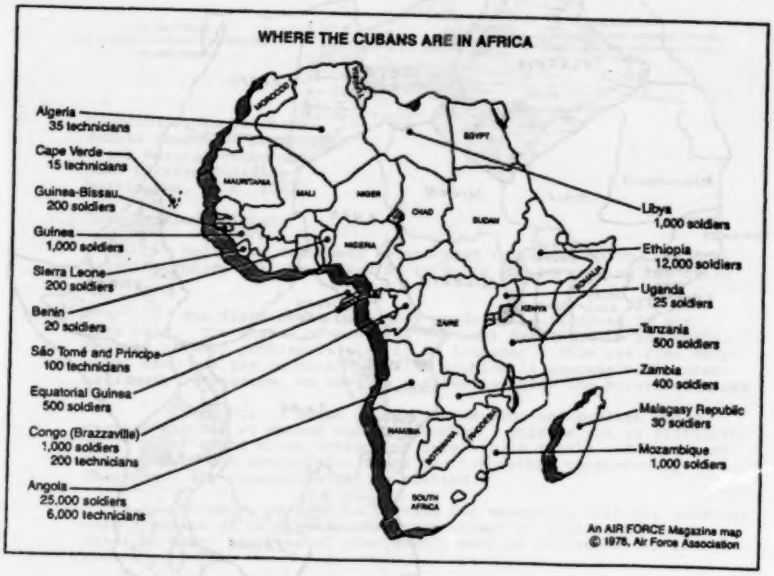
Commodity	Percentage of Needs Imported by U.S.A.
1. Columbium	100
2. Mica (sheet)	100
3. Strontium	100
4. Tin	100
5. Rutile	100
6. Chromite	100
7. Manganese	99
8. Cobalt	98
9. Tantalum	95
10. Antimony	94
11. Bauxite	91
12. Nickel	90
13. Asbestos	86
14. Aluminium	85
15. Fluorine	82
16. Bismuth	80
17. Platinum Group Metals	80
18. Mercury	73
19. Zinc	64
20. Tellurium	59
21. Selenium	58
22. Tungsten	54
23. Beryllium	51
24. Cadmium	50
25. Potassium	49
26. Gold	45
27. Gypsum	39
28. Vanadium	36
29. Iron Ore	35

EXHIBIT 2

COMBINED SOUTHERN AFRICAN AND U.S.S.R. PERCENTAGES
OF WORLD'S RESERVES OF SELECTED MINERAL COMMODITIES

Commodity	Southern Africa's Percentage of World's Reserves	U.S.S.R.'s Percentage of World's Reserves	Combined Southern Africa and U.S.S.R. Percentage
1. Platinum Group Metals	86	13	99
2. Manganese Ore	53	45	98
3. Vanadium	64	33	97
4. Chrome Ore	95	1	96
5. Diamonds	83	4	87
6. Gold	50	19	69
7. Vermiculite	60	N.A.	60
8. Fluorspar	46	4	50
9. Asbestos	25	25	50
10. Iron Ore	5	42	47
11. Uranium	27	13	40
12. Col.-Tantalite	38	N.A.	38
13. Cobalt	25	N.A.	25
14. Copper	13	9	22
15. Titanium	5	16	21
16. Nickel	12	7	19
17. Zinc	10	8	18
18. Lead	4	13	17
19. Coal	5	10	15
20. Phosphate Rock	8	4	12
21. Tin	4	6	10
22. Antimony	4	5	9

THE CUBAN-SOVIET PRESENCE IN AFRICA



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August 18, 1980

Honorable John Melcher
Senate Committee on Energy
and Natural Resources
3106 Dirksen Building
Washington, D. C. 20510

Dear Senator Melcher:

During my testimony before your committee on the National Material Policy Act, you asked me to write you concerning two basic points.

The first one I feel that needs to be improved is our data base. The Bureau of Mines is the best data base in the world, but its primary problem is that it is interior. This was fine many years ago, but the critical material problem is increasingly international. Therefore, we need to internationalize the Bureau of Mines.

Secondly, I think we need to develop and publish early warning signals of coming supply crunches. This is not as difficult as it might sound since production capacity is fairly well known or determinable and consumption tends to rise rather consistently. Therefore, the crossovers can be plotted.

Thirdly, we need to provide for measuring critical material supply impact as we measure inflation impact on actions that are taken by other branches of government, such as environmental laws, etc.

Further, we need to develop a political risk measurement which would measure the degree of risk for items which are plentiful but may be cut off because of political or military action.

The second major point that was mentioned was multinational corporation relationships to L.D.C.'s. It is estimated that, over the next decade, foreign investment in L.D.C.'s for critical material facilities will have to be increased 500% over the past decade. Therefore, how do we protect from being nationalized the U.S. multinational corporations who have the capital, skills, technologies, etc., necessary to develop these assets? How do we provide the infrastructure in these poor countries (roads, power, skilled labor, transportation, etc.) when the development project itself will not support such major investments standing alone? How do we change

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our domestic antitrust laws and strengthen our international laws so that an American multinational can join in consortium with others, as other foreign nationals do, without running afoul of our domestic laws? How do we entice our multinational corporations into investing in a L.D.C. project when the country insists that the local government be the majority owner, that the management be unqualified local nationals, and that they control the marketing and financial matters.

These are the comments that I was prepared to make when the hearings had to be recessed.

I hope this is useful. If I can be of any further service, please let me know.

Sincerely yours,

E. F. Andrews, Vice President
Materials and Services

mjh

[Whereupon, at 11:26 a.m., the hearing was recessed, to reconvene at 2 p.m.]

AFTERNOON SESSION

Senator MELCHER. The subcommittee will come to order.

We have two more witnesses in today's hearing. Mr. David Swan, vice president, Kennecott Corp. representing American Mining Congress is the next witness.

STATEMENT OF DAVID SWAN, VICE PRESIDENT, KENNECOTT CORP., REPRESENTING AMERICAN MINING CONGRESS

Mr. SWAN. Mr. Chairman, I will dispense with reintroducing myself if I may. I am sure that all of us recognize that the Mining Congress is a national business organization whose membership includes producers of the country's metals, coal, industrial and agricultural minerals; as well as manufacturers of mining and processing equipment, mining machinery and supplies; as well as engineering, consulting, and financial institutions that serve the mining industry.

I would like to express our appreciation for the opportunity to participate in these hearings. Rather than read my written statement, I would like to, in the interest of brevity, simply cover some of the high spots that we believe should form certainly the justification for a minerals policy and the elements which we believe should form the backbone of the policy.

Senator MELCHER. Your entire statement, Mr. Swan, will be made part of the record. Please proceed as you see fit.

Mr. SWAN. First of all, I think the bill under consideration does recognize an effective minerals policy is necessarily an integral and probably an inseparable component of an overall materials policy and, in turn, this is part of our industrial, in fact the underlying cement which is necessary in the conduct of industrial society.

Now, in the formation of an effective national minerals policy I think we have to—and I hope I am not repeating things that are obvious. But we have to recognize some of the inescapable realities about the nature of minerals. Part of our program is I think that these have not always been clearly perceived by the various Federal policymakers concerned with a de facto mineral policy which results of course in the definition of the degree of freedom we have to resolve any policy conflicts.

First of all, minerals are unequally distributed and generally occur in small areas relative to the land mass in distinct pockets throughout the Earth's crust. Therefore, the location of these deposits is determined by geologic and not geographical, political considerations.

I think the second important part is because with time the extraction processing of minerals has tended to become more costly and by that I mean it requires larger amount of capital to undertake a given mineral project which results in long-lead times and large projects, which means, in planning on a minerals basis, one commonly thinks in terms of time spans of 10 to as long as 30 to 50 years in exploring large deposits.

Finally, as we have developed increasingly complex materials which are the derivative products of minerals, these have become

the building blocks of really the American or industrial economic system and increasingly form a vital part of our defense technology.

The next thing I would like to mention is that basically there are three kinds of problems that can and must be addressed by a national policy. I sort of led up to these in these brief descriptions of the kinds of constraints that the mineral industry faces.

First are problems which are the result of natural forces. These principally involve the inescapable facts that as we exploit our mineral resource base we face a shrinking frequency of sizable deposits and generally have to operate with increasingly lower grades of ore, particularly in a high population like the United States.

These natural problems present increasing challenges to exploration and exploitation technology and they are generally dealt with by technical improvements.

Second, there are a whole series of problems which are societal in nature and these must be viewed from both a United States as well as a worldwide perspective. Included, among other problems, are the increasing population, the distribution of population, expanding industrialization, mobility of people, all of which continue to result in increased competition for resources, particularly including the land which can hold undeveloped oil deposits.

Ironically, the same competition caused fundamentally by an expanded standard of living and more people usually is accompanied by increased demands for the goods and materials which are developed to serve those goods. So we are in kind of a difficult situation. As we increase our standard of living we increase the pressure on the system which provides the minerals.

The third type which follows from the second usually is political in nature. The problems I think are manifested in the United States in two ways. One is the delay or difficulty of the executive and legislative branches to effectively balance the various needs of our society with the pressing and ever-growing demands for minerals and materials in competition with other national goals.

A second equally important international problem is the growing trend among world governments to intervene in mineral markets in the free marketplace to achieve political and economic and, in some cases, strategic objectives. While a new national minerals policy will certainly play an important role in addressing the first two types of problems, it can certainly help in providing the kind of technical fixes we need to maintain productivity, and we can certainly anticipate the political problems which will flow out of these societal changes.

It is the political arena that makes for most of the media attention. In fact the failure to solve these political problems will effectively deter any successful solution of the national and societal issues.

I must say, Mr. Chairman, the mining industry is alarmed by the decline in recent years. We see a very adverse trend taking place in such factors as the budget, the allocation of resources and the influence of those Government agencies which have historically supported our minerals and materials technology informational base.

The scope of the missions performed by such agencies as the U.S. Geological Survey, the U.S. Bureau of Mines, have declined as they relate to the mineral base of the United States. We urge that this be reversed. We recognize it is a difficult problem but certainly think it is an important one to solve.

Another immediate need—and I think this is recognized in H.R. 2743—is to implement an effective mechanism for resolving on a systematic, ongoing basis the policy and procedure conflicts among the many Federal agencies having direct or indirect responsibility for minerals and materials. We believe that the record of the executive branch in reconciling these policy conflicts and seeking tradeoffs among minerals and other national goals has not been encouraging.

Part of this is because single-mission agencies have developed—in fact they almost legislate—rules and regulations in an individualized and fragmented manner without regard for the cumulative effects upon the regulated sector, the economy or the American consumer for that matter.

Public land programs, environmental standards and regulations, occupational health and safety rules, mine safety, trade policies, antitrust regulations all have the effect of cumulatively added, layer-on-layer of cost and delays on an industry which is faced with severe national problems in maintaining competitive posture.

The cumulative adverse impact on the domestic mining industry is to cut off or slow down the development of critical ore reserves that would otherwise strengthen our economy. The total regulatory burden is steadily reducing the U.S. capability to undertake the level of the certain development necessary to secure the productivity which will enable us to compete with foreign industries and be responsive to national mineral needs. In the development of this new regulatory burden we find little overall direction and precious little coordination. We can find no evidence, for example, of the executive branch applying the basic guidance Congress has expressed in the Mining and Minerals Policy Act, and I will quote, "to insure an economically sound, stable domestic industry to help assure the satisfaction of industrial security and environmental needs."

An example of the myopic view taken by some Federal officials toward this problem is the recent memorandum signed by the Secretary of the Interior, which signaled the conclusion of the last nonfuel minerals policy study.

Addressing the concerns over competitiveness of the U.S. minerals sector, the Secretary placed the blame for industry problems solely upon declining ore grades, higher labor costs, and the like, blithely absolving the Government in this decline, what is agreed upon as a decline.

We must recognize that it is one thing to articulate an active policy which was done in the 1970 Mining and Minerals Policy Act. It is another matter to actually implement a specific program, particularly one that is flexible enough and strong enough to serve both the country's economy and the governmental process.

We think that while a national planning system—and I would like to again express the mining congress and my own personal opposition to trying to solve this problem by means of an overall

national planning system. We do believe that it is necessary to institutionalize an ongoing mechanism to identify and reconcile policy conflicts in the context of the broader goals of the Mining and Minerals Policy Act. Given such a systematic process, the integral components of the broad materials and minerals R. & D. goals can be developed and we can begin to officially coordinate Federal minerals and materials R. & D. programs with industry to achieve our overall national objectives.

What we would suggest, Mr. Chairman, is that the Congress should adopt such an approach by amending H.R. 2743 to charge the executive branch with the following specific responsibilities, and these I believe are consistent with the intent of the act.

One is the identification and assessment of those major public issues which either adversely or positively impact all stages of the materials cycle from exploration to final product use.

Two, to identify the current Government policies and actions which impact the same stages either positively or adversely.

Three, to assess the various and collective impacts of the policy impacts of the policies identified in the second set; that is, what Government actions have been taken or are under way.

Finally, four, which is I think very important to identify and analyze alternative actions, including changes in these policies or changes in the regulations which would minimize or eliminate the adverse impacts identified in the third step.

And finally, on the basis of this study and analysis, recommend legislative and/or administrative initiatives necessary to reconcile these policy conflicts to achieve the goals for a better balancing of the goals of an overall minerals and materials policy.

Another important activity which we think should be addressed, and I think is addressed in the bill under consideration, is to provide a better mechanism for voluntary coordinating the Federal and private sector R. & D. programs which will lead to the solution of the national types of problems.

We would suggest that the organization, to fulfill these proposed responsibilities, be a strictly policy analysis body, not merely another mechanism to perpetuate and fuel the Federal bureaucracy.

To achieve this we would recommend that "all" affected parties be involved in developing and implementing an analytic process which would include representation from the academic sector, the mining industry, consuming industries and consumer groups. We would further recommend that the Congress require a detailed annual report to the legislative branch and perhaps to specific committees or joint committees detailing the actions which are recommended to meet the stated responsibilities. This report would fulfill the intent of the Mining and Minerals Policy Act of 1970.

An obvious question is where such an entity might be organized, and certainly we are not going to presume to tell you. But we would like to offer some alternative ways in which those problems can be answered.

There are all kinds of options ranging from assignment of the responsibility to one of the currently concerned agencies or creation of a new, independent organization. Each has pros and cons associated with it.

The experience of recent years and the failure of the most recent Nonfuel Minerals Policy Review lead the mining industry to fear that if the responsibility for doing this policy analysis job were vested in a single agency, a mission-oriented agency, that insufficient attention might be paid to resolving the policy conflicts which we think are the major problems that must be addressed.

Therefore we think that the responsibility for executing the analysis function must be independent of the basic Cabinet department and in accordance with the proposed bill. It should reside directly with the President but also be authorized by and accountable to the Congress. This idea is not without precedence, such as we have had organizations such as the Council on Environmental Quality, and the like. It would be quite possible to assign responsibility for this to an existing Executive Office agency. In this regard the Council of Economic Advisers would be the logical candidate although they would clearly need new resources to do the job.

I think our view is fairly clear, that "ad hocism" simply doesn't work. We don't need more studies, reviews, and commissions. What "is" needed is a formalized, institutionalized and continuing process to assure that minerals and materials needs are seriously and systematically taken into consideration throughout the governmental process.

Given this framework, the R. & D. programs which support mineral policy and would work toward solving technological problems can be undertaken with assurance that the policy won't change when the program is completed.

And finally, Mr. Chairman, we would urge that the Senate adopt many of the provisions that were originally included in the House version of H.R. 2743. In the interest of time I won't go through these in detail. I would be very happy to answer any questions, and thank you for your time.

Senator MELCHER. Mr. Swan, I think your testimony is helpful. It is very difficult for a committee of the Senate—this particular one or some other committee—to positively recommend another agency.

We have kind of backed into the American Mining Congress. I think we have kind of eased into it and I don't detect it is with a great deal of enthusiasm. Is that correct?

Mr. SWAN. I think that is correct. I think we have given a good deal of thought to this and feel that if we were in a position to do this, which we are not of course, that this is a subject, a subset of the kinds of problems the Council of Economic Advisers is set up to deal with.

Senator MELCHER. Only they don't know how.

Mr. SWAN. They don't apparently want to.

Senator MELCHER. I think you have couched your discussion on that by saying they need more resources. I think you mean they need more expertise, don't you, and knowledge and experience and background?

Mr. SWAN. Certainly the leadership of such an effort would have to have some.

Senator MELCHER. You can be very, very frank with me. I don't know about the record, but with me you can be very frank. I don't

think you are trying to tell me. They can get different space right now for doing anything like this.

Mr. SWAN. I would have to agree with that.

Senator MELCHER. I don't think they can get out of the end zone, let alone score a touchdown. Well, ideally—well, not ideally, but it is a logical place for it to be.

Mr. SWAN. Yes.

Senator MELCHER. And you say have it in the executive branch. I would say have it in the legislative branch if I thought we were capable of having an ongoing function. That way we could keep abreast of it.

The only thing I know of that keeps going on and on, and periodically contributes something worthwhile, that is a branch of Congress is the General Accounting Office. This would not be their type of thing.

We have a Library of Congress, the General Accounting Office, U.S. Printer—that is about all we have got—and something called the Office of Technology.

Mr. SWAN. The Office of Technology and Assessment?

Senator MELCHER. As of the last several years it is hard to find what they have done of any particular merit so I can't grab on that. I don't know. I guess you are right. When you use this whole series, you have six here, I don't know whether that is supposed to be all-inclusive. But as I view some of the problems—well, let me see if I can view any of these problems correctly. You are saying that in order to get some materials—let's say minerals—that there is a lot of conflict in laws that have been enacted? You say Government policies and actions but you mean laws, don't you?

Mr. SWAN. It is debatable. In some cases the laws themselves are the cause of the problem. In other cases it is the agencies charged with enforcing the law, interpretation of these laws, which leads to delay.

Senator MELCHER. Let's take a for instance. Let's start with mining. Part of it is getting permits on Federal land to mine. That would be one, and that would be a lot of confusion; that could go on for years. All right, if you have got the mineral then let's take copper. Those are laws regardless of who interprets them. It is still a law.

You would want this agency to identify a bottleneck as a bottleneck and recommend something to help or what?

Mr. SWAN. Precisely. Let me speak, if I may, to the environmental problem. I don't think we have a serious conflict between the mining industry unless they are a regulatory body as to the need to reduce emissions.

However, the relative cost of removing, at the margin, an additional pound of sulfur tends to become esentotic, that is the last pound down to zero might cost you $1 million. So what is called for is a judgment as to the degree of cost effectiveness; in other words, where you balance the public health and welfare impact as to the industry. Under the present ground rule we find ourselves in conflict with the EPA who naturally take their mission as primarily one of protecting public health and welfare and not worrying about the economics of smelting.

Now, somebody has to worry about the economics of smelting and we hope that somebody is concerned with it before we lose the smelting portion of the industry. We have already identified by the GAO—while some industries partially due to the impact of environmental regulation. Among these is Mr. Andrews' example of chromium.

This has decreased our options in places where we can get chromium as a for instance. Part of this was due to environmental regulation, part of it was present policy for energy.

Senator MELCHER. Part of it was also due to the fact it was cheaper to get it somewhere else.

Mr. SWAN. This resulted in it being cheaper to get it somewhere else.

Senator MELCHER. It is a lot cheaper to get it somewhere else. We had I don't know how many tons of chrome stocked up there in Montana which was sold for very little. It is a whole lot cheaper to buy it from Rhodesia or get it from Russia to my understanding. Am I wrong?

Mr. SWAN. You are absolutely right. I am not talking about the ore. I am talking about the conversion capability, the analog of the copper smelter.

Senator MELCHER. Let's get back to copper. Now, one thing that bothers me is, first of all, I agree something is desperately needed, whether it is another Federal agency which I would almost gag at or something permanent as an arm of Congress. Something desparately needs to be done and it has to be continuous and ongoing.

I have more faith in the executive branch looking at things objectively. I guess we ought to have more faith in our Government. But I am having a little problem myself right now having faith in the executive branch looking at something objectively and carrying through from one administration to the next. I would hesitate.

I think your testimony and the testimony of Mr. Andrews this morning was we didn't really know if Interior would be the right place. You are going to overlap several jurisdictions within the executive branch?

Mr. SWAN. That is right.

Senator MELCHER. One thing I noticed was none of the six get into taxes or the policy that we have in relationship to other governments, and the Congress specifically—it seems to me, I don't want to oversimplify it, but it is taxes and poor regulations. It seems to me we cannot tolerate letting our domestic industry be backed into a deep corner and sometimes out of existence by imports from countries who subsidize, who own, operate and in every way subsidize their production of copper.

Mr. SWAN. We seem to not want to exclude trade policies, tax policies from the kinds of policies which impact.

Senator MELCHER. You want to include that?

Mr. SWAN. Yes, sir.

Senator MELCHER. I sometimes wonder whether on this point my concerns of safeguarding our domestic industry isn't shared as much by the domestic industry because they are either operating internationally or maybe looking to operate internationally.

Can you reassure me that the first concern of the copper industry, whose companies are organized here and principally here in this country, that their first concern is to maintain a domestic industry, and if push comes to shove will tell Zambia or anybody else that wants to do it that we are going to set up the type of proper restrictive barriers against their product coming into our country?

Mr. SWAN. I think it is difficult for an individual company to make such a judgment. I think its first objective is probably to survive as an entity, which means that it has to make a profit in the long run. It does this by providing a service. But I don't think the company, an individual firm or an individual plant, is in a position to measure the impact of this action necessary to survive in the same conflict that I have described on the national purpose. Further, I think in order to answer that kind of a question you have to site what the industry—for example, we have I believe in this country a very viable copper mining industry. We have a smelting segment which we have associated with mining that is jeopardized, its very existence is jeopardized.

The new smelting capacity that is being built in the world is not being built in the United States. We are spending a lot of money on meeting environmental regulations.

Now, if we lose our smelting capability while we were still retaining a strong money capability, we will lose something important I believe to the security of the United States.

For example, if we start exporting concentrates, we will certainly lose byproducts that are commonly associated with these concentrates.

Senator MELCHER. I have a different viewpoint than a lot of people in Congress and perhaps the public. One policy we have never addressed and I think we should is what is the responsibility of public health to pay for what it costs to have pure air and clean air.

We have gone just part way. We say we want clean air and obviously we should clean up the air. But I am afraid we are never going to get there or reach our goal in my lifetime unless we admit for purposes of public health to better finance. I think it would be wrong. We are talking about losing the copper smelting industry and the capability in this country. I think we have lost control of the industry. I think it is crazy. I think it is intolerable that copper or any other significant metal—we do everything we can to maintain the industry here which includes the smelting so we can have the final product here.

Now, the question is how we get there. On air pollution control, I don't think it has been properly addressed. It is up to the Congress and the public. Perhaps it should be the public first, the Congress will act on it to admit that the clean air is a public health measure, where we draw that line. I know a lot of people say we can't finance industry. If they can't clean up their act they ought to shut down. That is a simplistic answer.

I don't want industries shut down in America. I want them to continue, but yet I want clean air, and if I could have it in my lifetime or my children's and grandchildren's lifetime——

Mr. SWAN. Senator Melcher, I think this is the kind of situation that gets us being viewed as unpatriotic or something. In other words we make an economic decision that it is cheaper to build new capacity abroad for whatever reason, then I think the subject of the criticism is you are being unpatriotic or jeopardizing the security of the company. So the firm is in sort of a catch 22 position.

Senator MELCHER. You seem to think that there is sufficient amount of information available for mining decision. For example, you think the data seems to be adequate. How far would you go? If you think the land data base is sufficient how far will you go on the rest of the data that is necessary for minimum periods?

Mr. SWAN. You can always justify a case for more data to make better decisions. I don't think the data that we have is insufficient to make wise decisions.

Senator MELCHER. You mean we have enough information?

Mr. SWAN. Fundamentally I think we have enough information to make reasonably intelligent decisions.

Senator MELCHER. What about proprietary data?

Mr. SWAN. It really influences policy influence. We have a pretty good idea of what our countries are up to, the technologies they employ. While we may not have access to their books, we know enough to make what I would call a strategic decision.

Senator MELCHER. You are always faced with this. Does a particular piece of public land have some capability for mineral exploitation? I am not sure that we are confident that if there is some proprietary information that these Government planners, the Bureau of Land Management, Forest Service, and what have you actually know about it. Do you feel that they do? Do you feel it is shared?

Mr. SWAN. No. I don't think, for example, drill hole data would be shared, the data from a drill hole log.

Senator MELCHER. Do you feel then that, if there were anything there, that somebody would be claiming it or moving on?

Mr. SWAN. Yes; I do.

Senator MELCHER. Do you think it protects itself that way?

Mr. SWAN. I do.

Senator MELCHER. We can't find out from the BLM or Forest Service either what potential there is in any given area, though you hear quite often when something is being proposed for a wilderness—and that is a classic confrontation—that it shouldn't be locked up because there is potential in what the USGS has. Quite often they don't have much and the Bureau of Mines quite often doesn't have much. If there is a way of getting more data base to make a better decision I would like to know what it is.

Mr. SWAN. I think the problem is more cost. Again, the policy which locks it up and makes it extremely difficult to acquire more data—and what usually changes with time is the circumstances which make the mineral more or less attractive. For example, when colbalt sold for $2 a pound and there seemed to be lots of it, there probably would have been little interest in exploring some of the wilderness areas which are now thought to contain cobalt. But it didn't appear worthwhile to spend the exploration money to prove or disprove whether it was there.

When cobalt is $40 a pound and about to shut down an industry it becomes terribly urgent. It seems again our policies and regulations don't allow for this degree of fragmentism or flexibility.

The knowledge hasn't changed; we are still ignorant of whether it is really there. But I have talked with geologists and looked at this same area in World War II for the same reason, and they assured me that there is a probability that this is a good exploration target.

Senator MELCHER. I know our goal in the wilderness areas is to be reviewed for mineral content every 10 years by USGS. I am not so sure that USGS is even capable of doing much. I think they might try to assess if anybody has any pertinent information. But I don't know that they ever go out and drill very much.

What would you do about it? How would you change it if you were going to recommend——

Mr. SWAN. First of all, I am a metallurgist and not a geologist. So if you will bear with a metallurgist's view of the kinds of things that should be done, it seems to me that the inflexibility of land withdrawal is the deterrent in determining whether there are minerals or not. Whether it is worth considering is the No. 1 problem. In other words, it is the situation that changes, not the presence or absence of the mineral mined.

No. 2 is the lack of resources which can be devoted either by the private or public sector to removing the uncertainties. In other words, this is a data problem and it goes back to drilling, exploring and from the private industry point of view there is no incentive whatsoever to explore a wilderness area even with a magnatometer if you don't think you are ever going to be exploited. You won't waste your money on it, you will go somewhere else where you think you can exploit it if you find something.

The USGS I think lacks the resources simply because of the budgetary limitations.

Senator MELCHER. I have to admit that. It has been that way ever since I have been in Congress. You say, "Well, why hasn't the USGS done that?"

Well, to be fair about it as far as I know we haven't really tried to give them a lot more money and a lot more people or more money to have more people so they could have a greater capability. But to be fair to USGS I don't think Congress has been very generous in giving them adequate funds for all the work that we have thrown at them which is quite a bit. Well, I want to thank you very much, Mr. Swan, for your testimony, and thank you for presenting your viewpoints.

Mr. SWAN. Thank you.

[The prepared statement of Mr. Swan follows:]

Testimony of

David Swan
Vice President
Kennecott Corporation

on behalf of

American Mining Congress

Mr. Chairman, my name is David Swan, Vice President of Environmental Issues for Kennecott Corporation. I'm testifying today on behalf of the American Mining Congress. The American Mining Congress is a national business organization that includes as its members the producers of our nation's metals, coal, industrial and agricultural minerals; manufacturers of mining and mineral processing equipment, mining machinery and supplies; as well as engineering, consulting, and financial institutions that serve the mining industry.

We appreciate the opportunity to participate in these hearings of the Energy Resources and Materials Production Subcommittee and to express the views of the domestic mining industry on proposed materials policy legislation.

Mr. Chairman, the American Mining Congress supports enactment of H.R. 2743 as approved by the House of Representatives on December 4, 1979. This legislation would establish a national policy for materials research and development -- strengthening our national materials and research capability and re-affirming the Mining and Minerals Policy Act of 1970.

At the outset, let me say that minerals, by definition, are the base of the broader category of "materials." Because minerals are the source of virtually all industrial materials, a healthy, competitive domestic mining and minerals processing industry is essential if we are to maintain our economic well-being and ensure our national security in an increasingly interdependent and uncertain world. An effective minerals policy, then, is necessarily an integral component of an overall materials policy, which is itself a basic ingredient in our domestic and foreign economic, trade, and defense policies.

The formation and implementation of a truly effective national minerals policy must recognize certain inescapable realities about the nature of minerals -- realities which unfortunately have not always been clearly perceived by Federal policymakers. Yet, these realities define the degree of freedom we have to resolve policy conflicts.

- Mineral deposits are unequally distributed in small and discrete pockets throughout the earth's crust;
- Mineral deposits are thus determined by geologic, not geographic or political considerations;
- The extraction and processing of minerals are costly and require long lead times, often as much as 10-30 years for a large project;
- Finally, minerals are the basic source of initially all industrial materials, and thus are the building blocks of our market system as well as our defense technology.

Mr. Chairman, there are basically three types of problems that can and must be addressed by a national policy such as is before this Subcommittee. First, there are those problems which are the result of natural forces. These principally involve the inescapable fact that we face a shrinking frequency of sizeable deposits and increasingly lower grades of ore, particularly for those minerals being sought and worked in the United States. These natural problems present increasing challenges to exploration and development technology.

Secondly, there are mineral problems which are societal and which must be viewed from both U.S. and worldwide perspectives. These include, among others, increasing population, expanding

industrialization, and greater individual mobility -- all of which will continue to result in an increased competition for resources, including the land which can hold undeveloped mineral deposits. Somewhat ironically, this competition accompanies increased demands for goods and materials, many of which are mineral-based.

The third type of mineral problem is political in nature, largely manifested in two ways. First, the delay of the Executive and Legislative Branches to effectively balance the various needs of our society with its ever-growing needs for minerals and materials. And second, in the growing trend among world governments to intervene in mineral markets to achieve political and economic, if not strategic, objectives.

While a new national policy will play an important role in addressing the first two types of problems -- particularly as it concerns minerals/materials research and development -- it is the political problem that begs for the most immediate attention. In fact, failure to solve the political problems will very effectively deter any successful solution of the natural and societal issues.

Mr. Chairman, the mining industry is alarmed by the decline, over recent years, of those government agencies which historically have supported the minerals and materials technology and informational base. Redirection of government resources has resulted in a continual restriction of the scope of mission permitted to such essential agencies as the U.S. Geological Survey, the U.S. Bureau of Mines, and the National Bureau of Standards. This trend is shortsighted at best and we urge that it be reversed.

Another immediate need -- which is recognized in H.R. 2743 -- is for the Government to implement an effective mechanism for resolving, on a systematic, ongoing basis, the various policy and procedure conflicts among the many federal agencies having responsibility for minerals and materials. The record of the Executive Branch in reconciling governmental policy conflicts and seeking sensible tradeoffs among minerals and other national goals has not been encouraging. Single-mission agencies develop -- in fact, almost legislate -- rules and regulations in an individualized and fragmented manner, without regard for the cumulative effects upon the regulated sector, the economy, or the American consumer. Public land programs, environmental standards and regulations, occupational health and safety rules, mine safety and health regulations, trade policies, antitrust regulation, anti-inflation policies, tax laws -- all have the effect of adding layer-upon-layer of additional bureaucratic red tape, cost, and delays. The cumulative adverse impact upon the domestic mining industry is to cut off or slow down the development of critical ore reserves that otherwise could strengthen our economy. The total regulatory burden is steadily reducing the capability of the minerals and materials industry to undertake the level of R&D necessary to compete with foreign industry and thus remain responsive to our national mineral needs.

In all of this massive regulatory burden, we can find little overall direction or coordination. We can find no evidence, for example, of the Executive Branch applying the basic guidance of Congress, as expressed in the Mining and Minerals Policy Act of 1970, to ensure the development of an economically sound and stable

domestic minerals and materials industry ... to help assure satisfaction of industrial, security, and environmental needs. An example of the myopic view taken by Federal officials towards this problem is the recent memorandum signed by the Secretary of the Interior, signaling the conclusion of more than two years of study of nonfuel minerals policy. Addressing the concerns over competitiveness of the U.S. minerals sector, the Secretary placed the blame for industry problems solely upon declining ore grades, higher labor costs, and the like -- blithely absolving government of any culpability.

Mr. Chairman, I must note that we in the mining industry have come to realize over the years that it is one thing to articulate and enact a policy establishing broad goals for the nation. It is, however, quite another matter to actually implement a specific national program, particularly one that is both flexible enough and strong enough to serve our economic system and governmental process.

In wrestling with this problem in past materials policy proposals over the years, the Congress wisely has always stopped short of authorizing a program that would entail economic planning along the lines of the Japanese model, where government would be a prime determinant in the allocation of production, distribution, imports, and exports. Indeed, while this model may at times seem tempting, as evidenced by the increased interest in industrial policy, the dynamics of the American economic system render it generally unworkable.

Nevertheless, the mining industry believes that executing a minerals/materials policy requires institutionalizing an ongoing mechanism to identify and reconcile policy conflicts in the context

of the broader goals of the Mining and Minerals Policy Act of 1970. Given such a systematic, coherent process, the integral components of broad minerals/materials R&D can be developed and we can begin to efficiently coordinate Federal minerals and materials R&D programs to achieve overall minerals/materials policy goals.

Mr. Chairman, the American Mining Congress respectfully urges the Congress to implement such a policy mechanism by amending H.R. 2743 to charge the Executive Branch with the following specific responsibilities:

1. Identification and definition of those major public problems, including government policies, which adversely or positively impact all stages of the materials cycle, from exploration to final product use.
2. Assessment of the various and collective impacts of the problems and policies identified in step 1 upon the materials cycle.
3. Identification and analysis of alternative actions, including new or changed policies, that would eliminate or minimize the adverse impacts identified in step 2.
4. Recommendation of legislative and administrative initiatives necessary to reconcile policy conflicts to achieve the goals of an overall minerals/materials policy.
5. Development of a mechanism for voluntarily coordinating Federal and private sector R&D program goals.

The mining industry further recommends that the Congress specifically assure that the organization proposed to fulfill these responsibilities would truly be a policy analysis body, not merely another mechanism to perpetuate and fuel a growing

Federal bureaucracy. To achieve this, we recommend that all affected parties be involved in developing and implementing the process, including academia, business, consuming industries and consumer groups. In addition, we ask the Congress to require a detailed annual report to the Legislative Branch -- perhaps to specific committees or a joint committee -- detailing specific actions that are being taken to meet the stated responsibilities. Such a report should be designed to fulfill the intent of the Mining and Minerals Policy Act of 1970.

An obvious question is where such an entity might be organized. The options range from assignment of the responsibility to one of the currently concerned agencies to creation of a new, more independent organization. There are pros and cons associated with each choice. For example, the Secretary of the Interior might be considered a logical choice for such a responsibility given the expertise available in the U.S. Geological Survey and Bureau of Mines. Yet, the experience of recent years and the failure of the most recent Nonfuel Minerals Policy Review lead the mining industry to fear that insufficient attention would be paid to policy conflicts. There is justification for placing this responsibility in the Department of Commerce as is proposed by the Senate revision of H.R. 2743. However, despite the economic and trade capabilities of that Department supported by the technological expertise embodied in the National Bureau of Standards, the realities of interagency rivalries and bureaucratic processes would hamstring Commerce.

The American Mining Congress believes that, to be effective the proposed minerals/materials policy responsibility must reside

directly with the President, and any related organization must be authorized by and accountable to the Congress. The idea is not without precedent; witness the Council on Environmental Quality and the Council on Wage and Price Stability. Still another possibility is to charge an existing Executive Office agency with these specific responsibilities for minerals/materials policy. In this regard, the Council of Economic Advisors would appear to be a logical candidate, although CEA would need new resources to do the job.

Mr. Chairman, the point here is simple. "Ad hocism" doesn't work. More studies, reviews, and appointed commissions on the subject are both unnecessary and wasteful. What is needed is a formalized, institutionalized and continuing process to assure that minerals and materials needs are seriously and systematically taken into consideration throughout the government process. Coordination is needed. R&D programs that support an overall minerals/materials policy and which work toward solving technological problems are needed.

Finally, Mr. Chairman, the American Mining Congress also respectfully urges that the Senate adopt many of the provisions that were originally included in the House version of H.R. 2743.

I would be pleased to respond to any questions. Thank you.

Senator MELCHER. The last witness is Mr. Brant Calkin of the Sierra Club.

STATEMENT OF BRANT CALKIN, SIERRA CLUB, SANTA FE, N. MEX.

Mr. CALKIN. Mr. Chairman and members of the committee, my name is Brant Calkin and I am employed by the Sierra Club in Santa Fe, N. Mex., to work on conservation matters in the States of Utah, Arizona, Colorado, and New Mexico. I am also involved in mining and minerals policy on a national level.

I would like to paraphrase here and there and respond to any questions. I would like to say I appreciate the opportunity to come here. When I talked to your staff about it I felt I was getting the same kind of invitation that General Custer got from the Indians.

But after seeing the schedule you are on today, I think General Custer would have survived the conflict of various committee meetings and so on pretty well.

I would like to say that I share the goals of the committee but I am skeptical that it is going to do much in the way of changing things. You mentioned the Mineral Policy Act of 1970 and I think quite frankly problems of that product that have fallen upon it will visit this product as well. I think what you are asking is useful.

I think there is reason why the 1970 act didn't work and I think there is a reason this one is going to have trouble. If you are going to look at what a policy is according to Webster you are going to have to put some teeth in things.

There are three things which I think are essential to have a policy. The three items are market, supply, and use. And we certainly don't have much control over the marketplace in terms of dealing primarily with minerals.

The price, availability, and quality is more a function of the London Metal Exchange than our national planning or economic needs.

You may think we have national planning going on but we really don't. Other nations can dump their copper on the market if they wish. That's their only way of raising foreign exchange and you have already mentioned this problem. That depresses their own market and causes problems at home.

I think we delude ourselves if we think we have a policy that makes a lot of difference in the way things happen in this country. So long as that market remains beyond our control, domestic companies can export on a world trade basis as well. It does a lot for our balance of trade. But a decision to export it doesn't get much review from any portion of the Federal Government, although it gets some, and it just takes—places that we didn't have a critical need. Speculators even domestically in conjunction with those outside of this country can alter some of our mineral commodity markets and do it very severely.

We can do a little bit through stockpiling. But basically there is some political interest in it as well as strategic and mineral aspects of it.

If we talk a little bit about supplying in addition to the market, we find that we have to speculate on the quantity, location and quality of our own data.

The public land component of mineral supply is dependent largely upon the application of the 1872 mining law. This law does not require the disclosure of information regarding the mineral deposits which are located, mandate their development, or even assure that their ownership will remain in the hands of U.S. citizens or businesses controlled by them.

The right to locate and stake the claim to the public's minerals carries with it no meaningful responsibilities, in spite of the possible dependence upon the mineral by the Nation as a whole, and the right to locate and stake a claim.

So we all have to guess, your staff has to guess, the executive branch has to guess, various groups within the society have to guess. That leads to the third missing element of the policy which is use. The phrase, "The law in its majesty allows both the rich and the poor to sleep under bridges," applies to the way we use minerals in this country today.

Chromium, which was mentioned here several times earlier, can go into toasters as well as tans, ski poles and into satellites, muleshoes and mass transit. Our balance of trade doesn't reflect what we use our imported chromium for, only that we use it and we had to pay for it.

We are urged to conserve oil but not manganese. I will not argue we should apply some omnipresent or draconian controls, but I must advise you that we will not do anything substantive so long as people can make those choices without regard to whether or not a mineral is a critical or a strategic need.

Now, given our disinclination or inability to control or even monitor market, supply, or use, the effects of this bill will be pretty modest. That is not to say that they are unworthy, but I would be misleading you if I were to say I thought it was going to have a direct outcome.

Now, I would like to relate one of the dilemmas I think you shared when you mentioned in some of your questions earlier a matter of roles designation. I take this opportunity to outline one of the related dilemmas which I routinely encounter and which we share. In the matter of wilderness designation, It is common for those who support wilderness to be opposed by those who feel the mineral values, real or imagined, should be preeminent.

The mineral surveys, even when completed, are not convincing to either side. The national security and economic well-being are then brought forth into the argument and we are asked to weigh these interests, and well we should, and to make a trade-off.

How do we know what the crucial need is? What is the evidence in terms of any Federal or national policy that allows us to determine whether or not we are dealing with something of real importance?

But where is the measure? So long as molybdenum is being exported to the Soviet Union, we cannot disavow a potential wilderness on the basis of national security. No malice again but it does create the dilemmas. So I must tell you that the problem is going to persist as long as we avoid the 1872 mining law.

We cannot have both its laissez-faire abandon and coherent national mineral policy to assure national security. We can't continue a give-away of public land minerals without even disclosure and

hope to have effective control over the resource. It reminds me of a situation where a man is asked, "Are you faithful to your wife?" and he says, "Frequently." Now, I am pleased to endorse what the committee is seeking in this bill and I look forward to working with you on other mineral policy which is for the 1872 mining law. I will be glad to respond to any questions the best I can. We will chat informally after the committee hearing.

Senator MELCHER. Your advocacy for forming the 1872 Mining Law isn't going to do a lot of good by generating support of ordinary people on conservation matters.

I came here from Montana and nobody discussed the 1872 Mining Law with me, and I found out it was so dear to so many people after I got here in Congress. I think it is always best to start with the grassroots out there in those mining States.

I don't see any real buildup opposition in the mining industry, and I use industry in a broad sense; that is, the mining industry talking about Kennecott or the big—I'll say big mining companies. That is the individual so-called prospector, so-called independents.

Now, there must be ways of improving it. The biggest opposition comes from the grassroots, in the States where you are representing the Sierra Club in Nevada and parts of California I guess and some of my own State, too.

I am not sure that this information is really available. I know we continue to talk about it. Well, what is a particular piece of land that is being considered for wilderness possibly in terms of minerals, and you really don't know, and I am not sure anybody knows. I don't think anybody is hiding it from us. I think it is very difficult, as Mr. Swan has finished testifying, for any company to consider going into an area that is being considered for wilderness and doing any amount of work, even of a nonservice degrading type of work, because they feel well, they probably won't have any opportunity to pursue it anyway. They get that feeling with justification because there is so mvch that I have become aware of in the past 12 years of really a movement, in the forest service lands for example, well, forget about ever doing anything there. We are not going to let this land be torn up. It is going wilderness, and we may have a track record to prove it, too. There have been a lot of areas that a lot of people probably would have liked to have done a little more work in exploration that have been told we feel its best use is going to be wilderness, and that proved to be the case in the study category.

Now, the same thing is going to be true of BLM. I wish it were different. This question that I just asked Mr. Swan I am going to ask you. We envision that wilderness areas are to be reviewed for mineral content by USGS every 10 years. Do you have any suggestions on that?

Obviously any mineral content that is there that somebody would want to recover is going to be so isolated. When we are talking about my own State and they find something that is really a good recoverable deposit it is going to be once or twice recommended here and there. So it is isolated. Maybe if it is the right kind of mineral maybe it would be in the national interest to recover it, even though the land is put in wilderness. We have

always said that could be done. Congress has always said that can be done if it is absolutely necessary.

But do you have any recommendations on how we should carry out this process of every 10 years the USGS making a reassessment of the wilderness areas for the mineral potential?

Mr. CALKIN. Senator, I can make a recommendation. I don't think it would be a new idea to you, and I quite frankly think it would be the anticipated result. Congress has really never funded the USGS level at the Bureau of Mines. I think that kind of funding is long over due. I don't consider it against my interest to have that information

I think the problem of having it exclusively in the name of a glimpse of the 1872 Mining Law does complicate things. We could anticipate that this ore might become economically feasible in 40 years. We could make some decision. But I think the simplest answer is the one that has been tried before and yet has yet to produce and that is fund the agency to do the job.

Senator MELCHER. The USGS?

Mr. CALKIN. Yes. At this point we are all shooting in the dark. I would add one other thing. There is a little more hope for the value of prospecting in wilderness and you may have heard earlier in those four States that I deal with I don't have much in the way of wilderness in the State of Utah. There is 28,000 acres which is generous by ordinary western standards. The other States—Kennecott has been in the White Mountain wilderness, and Mexico once, Superior Oil has gone in once. In Colorado I have got Oklahoma Power & Light, Chicago Basin, so people are actively drilling holes and are identified to clear wilderness in those States now.

They are hopeful I think. Sooner or later somebody is going to hit something big enough.

Senator MELCHER. It has been our intent for USGS to do that. I guess we haven't given them the wherewithall to do it. Maybe we should examine our budgetary restraints on USGS and give them the wherewithall to do a little more.

I want to thank you very much for your testimony. I think it is very productive and very constructive.

[The prepared statement of Mr. Calkin follows:]

by Ansel Adams in *This is the American Earth*

SIERRA CLUB

330 Pennsylvania Avenue, S.E.
Washington, D.C. 20003
(202) 547-1141

July 31, 1980

Mister Chairman and members of the Committee,

My name is Brant Calkin and I employed by the Sierra Club in Santa Fe, New Mexico to work on conservation matters in the States of Utah, Arizona, Colorado, and New Mexico. I also am involved in mining and minerals policy on a national level.

I am pleased to offer some comments and perceptions regarding minerals policy, but I must tell you that I share some of the frustration and despair that you feel as you try to reconcile seemingly conflicting activities and prorgams, as you contemplate implications for defense, foreign policy, domestic priorities, etc. As A result, although I share the noble goals of the committee print, my expectations could be charitably be described as modest, some would say "minimal."

"Policy" defined variously by Webster can be a high level overall plan, prudence or wisdom in judgement, or a course... to determine future conditions. We will never have a meaningful minerals policyby any of these definitions unless we have some control over 3 basic elements, control of which is currently lacking. These are market, supply, and use.

We certainly have little control over the marketplace. Strategic metals as well as common ones are a commodity of world trade. The price, availability, and quality is more a function of the London Metal Exchange than our national planning or economic needs. Other nations can dump copper on the market as their only way of raising foreign exchange, thus depressing our own market. Domestic companies export our molybdenum or uranium on a world trade basis, practically independent of long-range needs and strategies as perceived by anyone else. Speculators, whether foreign cartels or Dallas tycoons in conjuction with Arab financiers, can alter markets in silver or other commodities. We can make a modest impact

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in domestic markets through stockpile manipulations, but these are subject to pressures regarding unemployment and other factors more than national mineral needs. All in all, one can fairly say that no national mineral policy controls the market place or heavily influences it. I have considerable sympathy with those who say such control may not be proper, but absolute faith that such control will not occur, short of war or similar crises.

If we turn our attention to the question of supply, we find that the nation must speculate on the quantity, location, and quality of its own native ores. The public land component of mineral supply is dependent largely upon the application of the 1872 Mining Law. This law does not require the disclosure of information regarding the mineral deposits which are located, mandate their development, or even assure that their ownership will remain in the hands of U.S. citizens or businesses controlled by them. The right to locate and stake the claim to the public's minerals carries with it no meaningful responsibilities, in spite of the possible dependence upon the mineral by the nation as a whole. Military and economic planners, Congressional staffs, and other interests, economic or social are forced to speculate on essential strategic minerals as well as common ones. The situation might be compared to running a business in which you buy and sell, but never take inventory.

The third missing element of policy is use. The phrase "The law, in its majesty allows both the rich and the poor the sleep under bridges." has a parallel in our present use of minerals. Chromium can go into toasters and tanks, ski poles and satellites, muleshoes and mass transit. Our balance of trade does not reflect what we use our imported chromium for, it only reflects that we had to pay for it. We are urged to conserve oil but not manganese. We should save water, but we can waste tin. I will not argue now that we should apply some omnipresent or draconian controls, but I must advise you that it is unlikely that we will do anything substantive to create a mineral policy without at least identifiying which are the more crucial uses.

Given our disinclination or inability to control or monitor market, supply, or use, the effects of this bill will be modest. That is not to say that they are unworthy, but they are unlikely to directly affect the uncomfortable circumstances we now contemplate.

I take this opportunity to outline one of the related dilemmas which I routinely encounter and which we share. In the matter of Wilderness designation, it is common for those who support wilderness to be opposed by those who feel the mineral values, real or imagined, should be pre-eminent. The mineral surveys, even when completed, are not convincing to either side. National security and economic well being are injected into the argument, and wilderness proponents are asked to weigh these interests and make the so-called "trade-offs." But where is the measure? So long as molybdenum is being exported to the Soviet Union, we cannot disavow a potential wilderness on the basis of national security. None would argue the value of cobalt isotopes for medical purposes, but should we forgo wilderness so that the claimant under the 1872 Mining Law can sit on it indefinitely or even sell it to a foreign investor? Should we be asked to "trade-off" a potential wilderness so that some corporation can mine it to raise capital to pay foreign workers in an overseas assembly plant? I have no malice to those I have included in these imaginary examples; I have created them to illustrate the dilemmas. But I must tell you that the problem will persist as long as we avoid the reform of the 1872 Mining Law. We cannot have both its laissez-faire abandon and coherent national mineral policy assuring national security. We cannot continue a give-away of public land minerals without even disclosure and hope to have effective control over the resource.

I am pleased to endorse what the committee is seeking in this bill, and I look forward to working with you again on another element of mineral policy, the reform of the 1872 Mining Law.

Mr. Chairman, I appreciate the invitation to share these thoughts with you, and I would be pleased to respond to questions either now or informally after the close of the hearing.

Senator MELCHER. That completes our hearing and I believe it completes the hearing on the bill. The hearing is adjourned.

[Whereupon, at 3:45 p.m., the hearing was adjourned.]

APPENDIX

Additional Material Submitted for the Record

July 31, 1980

STATEMENT OF GARDEN STATE PAPER COMPANY, INC.
BEFORE THE
SUBCOMMITTEE ON ENERGY RESOURCES AND MATERIALS PRODUCTION
OF THE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
ON
H.R. 2743, THE NATIONAL MATERIALS POLICY ACT OF 1980

Garden State Paper Company appreciates the opportunity to share with the Committee its views on the vital issue of creating a national policy on materials research and development as contemplated in the proposed "National Materials Policy Act of 1980".

Garden State Paper Company is the world's largest recycler of used newspaper into fresh newsprint. Founded in 1960, Garden State Paper currently consumes over 500,000 tons of used newspaper per year at two wholly-owned recycling mills -- Garfield, New Jersey and Pomona, California, and a third joint venture mill with Field Enterprises in Alsip, Illinois. Since acquiring Garden State Paper in 1970, Media General, Inc., has further expanded the unique recycling process through a joint venture with the Mexican Government -- 90 percent of raw material supply is from the United States -- and another joint venture mill with Knight-Ridder Newspapers and Cox Enterprises. This latter mill in Dublin, Georgia, consumes over 150,000 tons of used newspaper annually, collected from six southeastern States. Thus, the Garden State recycling process is responsible for recycling three-quarters of a million tons of used newspaper per year, and

producing over 13% of the newsprint manufactured in the United States. Garden State is, nevertheless, very small, indeed, compared with other companies dependent on wastepaper. In 1979, 18.1 million tons of wastepaper were collected for reuse and recycling in the United States. This represents 25% of the annual paper supply in this Country. In the same year, 1979, the U.S. imported more than 9.1 million tons of paper and paper products, or 13% of its annual paper requirements.

It is noteworthy that this valuable industrial raw material is acquired through access to the municipal waste stream. Americans now generate more than 135 million tons of municipal solid waste every year. Its disposal is a growing problem in those areas of the Country where traditional methods such as open dumping, landfill, uncontrolled incineration, and ocean burial are too expensive or environmentally unacceptable. Yet, these wastes contain materials whose use could help conserve resources. Municipal solid waste includes more than two-thirds of the national consumption of paper and of glass, over one-fifth of the aluminum, and nearly one-eighth of the iron and steel. Recycling these materials requires less total energy than does the use of new resources, while at the same time reducing air and water pollution.

These abundant secondary materials are not always easily retrievable from the solid waste stream. Wastepaper, for example, is obtained by source separation methods -- before it is comingled with the garbage. Unfortunately, the supply of wastepaper currently collected for recycling is being threatened by the rush

to produce energy from municipal solid waste. Current Federal programs provide a wide variety of financial incentives designed to stimulate domestic production of synthetic fuels including fuels derived from solid waste. Understandably, the Federal Government must actively encourage the production of fuel from alternate energy sources in an effort to help solve our Nation's energy problems, but not by threatening the destruction of the Nation's waste material resources and the attendant substantial energy conservation benefits. A sound national energy policy should maximize the overall energy potential of the municipal solid waste stream by recognizing the compatibility of materials and energy recovery.

We are gratified to note that the "National Materials Policy Act of 1980" recognizes the importance of recycling as part of the overall solution to conserving materials and natural resources. We applaud the effort of the Congress to establish the framework for developing a national materials policy and urge that the program be expanded at this time to recognize the importance of recycling materials, such as source separated wastepaper, prior to the production of energy from such materials.

National Association of Manufacturers

STATEMENT OF

THE NATIONAL ASSOCIATION OF MANUFACTURERS

ON

THE NATIONAL MATERIALS POLICY ACT

H.R.2743

BEFORE THE SENATE COMMITTEE

ON ENERGY AND NATURAL RESOURCES

JULY 31, 1980

1776 F Street, N.W. • Washington, D.C. 20006 • (202) 626-3700

The National Association of Manufacturers, a voluntary membership organization of more than 12,000 companies engaged in manufacturing in the United States, submits these comments on H.R.2743, The Materials Policy, Research and Development Act. Together, these companies produce approximately 80 percent of all goods manufacturered in this country. NAM is affiliated with an additional 158,000 companies through the National Industrial Council and NAM's Associations Department. NAM strongly supports H.R.2743 as a first step towards minerals independence, and applauds the Committee's interest and effort in redressing one of this nation's most serious international dependence problems.

NAM, counting among its membership the miners, refiners, smelters, casters and final users of all nonfuel mineral types, has recently embarked on a program for the Revitalization of American Industry. One of the cornerstones of this program is our commitment to the development and implementation of a strong and comprehensive domestic minerals research, development and production policy.

Not until OPEC got our nation's attention in 1973, did many Americans become aware of our critical dependence on foreign sources for many of the raw materials on which the defense and economy of this nation are based. This problem, however, has been a thorn in the side of this nation going as far back as 1952. Under the Truman Administration, the Paley Commission Report in 1952 detailed the problem and recommended specific actions. Unfortunately, little if any action has occurred since the report was published. This nation can no longer afford to allow this situation to persist.

Minerals of critical concern are used in all sectors of the economy including jet aircraft, jet aircraft engines, steel production, pollution control devices, electronics, etc. Suffice it to say that without adequate supplies of these materials this nation would be hard pressed socially, economically and militarily.

The Department of Interior's Office of Minerals Policy and Research Analysis published a study last year entitled,

"Developing A Critical Minerals Index: A Pilot Study," which indicates that:

> "cobalt is the mineral of greatest relative concern during the 1979-84 period, being most susceptible to disruption in 1980 and 1981 and having a probability of disruption exceeding 0.6 (60 percent) in both years."

The study also addresses the economic impacts of supply disruption, listing such factors as a net resource loss, diminished real income of U.S. consumers, and reduction in total consumption. According to the Department of Interior, disruption can be measured in terms of:

> "the costs of lost production resulting from reduced imports, increased costs from expanding less efficient U.S. production, the costs of substituting less cost-effective minerals, and the transfer of U.S. wealth to foreign producers because of higher prices for remaining imported supplies."

Similarly, Mr. Amos A. Jordan and Dr. Robert A. Kilmarx in their report entitled Strategic Mineral Dependence: The Stockpile Dilemma (The Washington White Papers, Volume VII - The Center for Strategic and International Studies, Georgetown University, Washington, D.C. 1979.) point out that:

> "The increased politicization of raw materials...raises the issue of access to certain critical materials and presents a formidable challenge in view of the large U.S. minerals import dependence. Recent events have thrust the subject of raw materials to the forefront in relations among nations."

Robert Z. Lawrence, Research Associate for the Brookings Institution stated in his testimony before the Committee on Commerce Science and Transportation on July 2, 1980, that:

> "From 1972 to 1974, raw materials prices rose one hundred and fifty percent and touched off the worst inflation of the postwar period. In OECD member countries the inflation rate soared from

> 5 percent in 1972 to 12 percent in 1974. These events had far reaching ramifications as domestic policy efforts to curtail inflation led to the worst global recession in the postwar era -- In 1975 alone, the decline of OECD production from trend totalled more than $350 billion and the number of persons unemployed rose by over 4.5 million compared to 1973."

The NAM is deeply concerned about the continual withdrawal of public land from mineral entry. Withdrawals stemming from the Forest Services' Second Roadless Area Review and Evaluation (RARE II) and the Bureau of Land Management's Wilderness Review and the Alaska National Lands Act are contrary to the goal of a sound minerals policy (see charts attached).

No areas of public land should be closed to or restricted from resource development and non-wilderness multiple uses in the absence of compelling national interest which override the need for adequate domestic oil and natural gas, coal, water, agricultural products, minerals, timber and other valuable resources. Before areas are set aside for exclusive uses, every effort should be made to determine the availability of materials and other resources on the proposed set asides, and access should be assured for exploration and development of the area's resources. The majority of uses are compatible most of the time, while all uses are compatible on a rotational or successive basis.

To adjust to changing needs, demands and supplies, as well as other circumstances, Congress should periodically review the desirability of continuing previous closures, restrictions or other set asides at the least every ten years. The NAM recommends that Congress and the Administration should commence releasing areas that have previously been closed, restricted or otherwise set aside.

H.R.2743

The NAM raises the following points about the proposed legislation:

> The authority for the proposed mineral/materials policy board should not reside in any one Cabinet-level Department. More studies, reviews and appointed commissions on the subject are

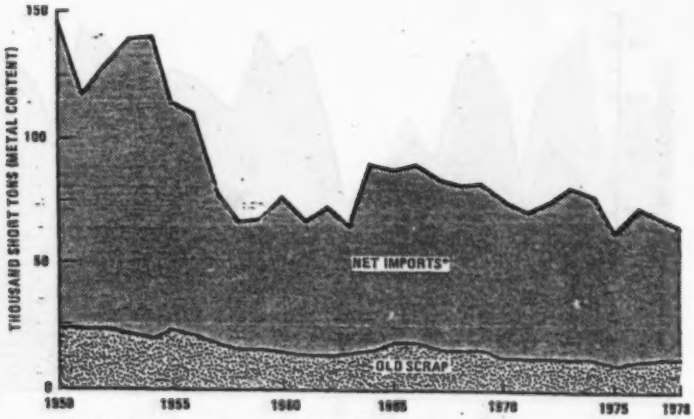
both unnecessary and wasteful. What is needed is a formalized, institutionalized and continuing process to assure that minerals and materials needs are taken into consideration in the governmental process. Coordination is needed. R & D programs that support an overall minerals/materials policy and which work toward solving technological problems are needed.

The finding under Section 105, which states, "notwithstanding the Mining and Minerals Policy Act of 1970 and the directives and provisions contained therein to the Secretary of the Interior to carry out its provisions, has not been implemented resulting in the absence of a coherent national minerals policy."

The provision under Section 105 calls for a report within one year prepared jointly by the Secretary of Defense and the Secretary of the Interior (and such Cabinet members deemed necessary) assessing the critical materials needs related to national security and identifying the steps necessary to meet those needs. (We would advance the deadline for this report to six months).

A careful study of our options is warranted before this nation embarks on any given course of action. Clear and decisive direction must, therefore, come from the Congress--H.R.2743 is a step in that direction.

Thank you for the opportunity to address our concerns.



*Net imports = imports minus exports of ore and metal, plus adjustments for changes in stocks.

Source: Bureau of Mines, U.S. Department of the Interior. Import-export data from U.S. Bureau of the Census.

Figure 2-8. U.S. consumption of tin, by source, 1950 to 1978.

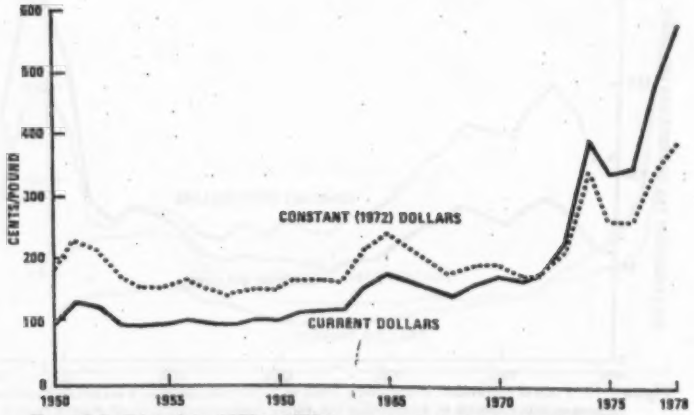
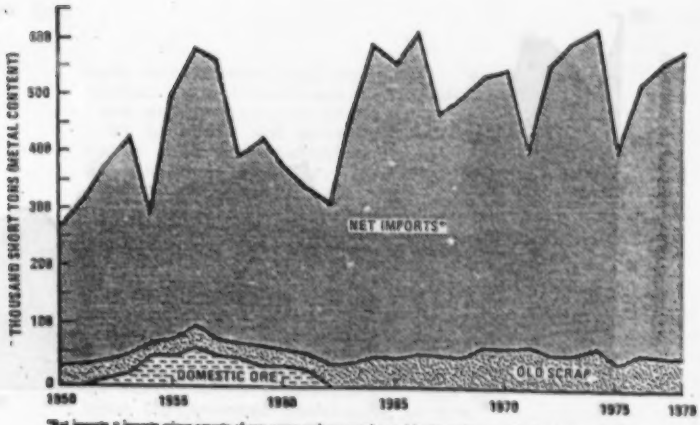


Figure 2-9. Price of tin, 1950 to 1978 (average annual price for New York prompt delivery Straits tin as published in *Metals Week*, McGraw-Hill Book Co., Inc.).



*Net imports = imports minus exports of ore, scrap, and processed materials, plus adjustments for changes in stocks.

Source: Bureau of Mines, U.S. Department of the Interior. Import-export data from U.S. Bureau of the Census.

Figure 2-16. U.S. consumption of chromium, by source, 1950 to 1978.

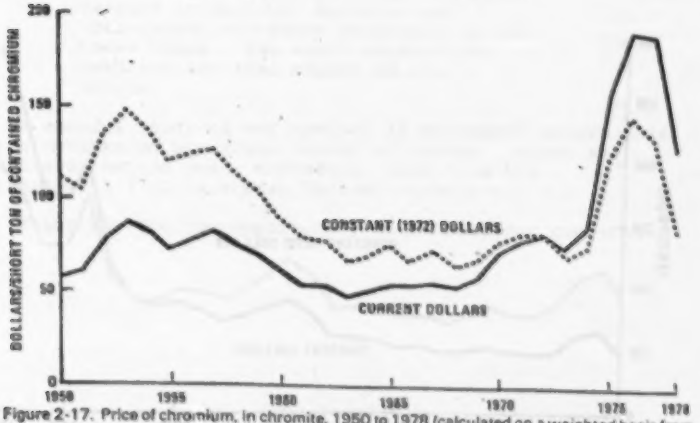
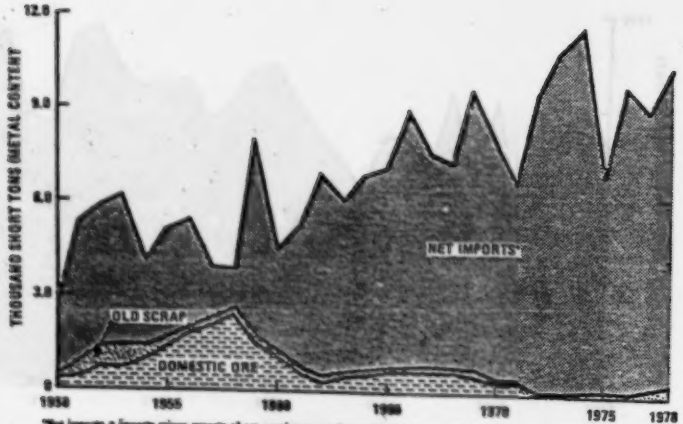


Figure 2-17. Price of chromium, in chromite, 1950 to 1978 (calculated on a weighted basis from consumption patterns in consuming industries; quoted prices as published in *Metals Week*, McGraw-Hill Book Co., Inc., for Turkish and South African chromite, and personal communication from industry for Philippine chromite).



*Net imports = imports minus exports of ore, semi-processed materials, and processed materials, plus adjustments for changes in stocks.

Source: Bureau of Mines, U.S. Department of the Interior. Import-export data from U.S. Bureau of the Census.

Figure 2-18. U.S. consumption of cobalt, by source, 1950 to 1978.

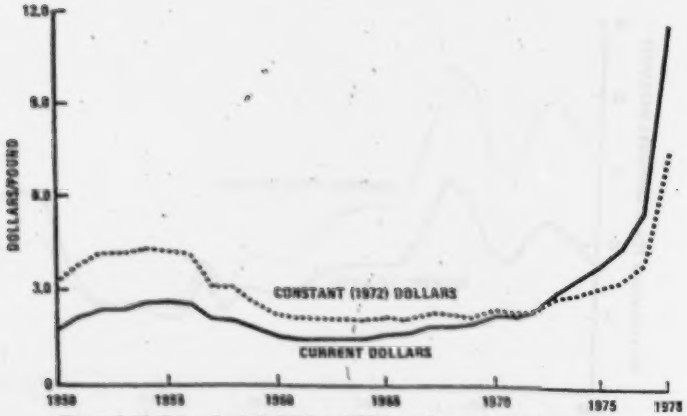
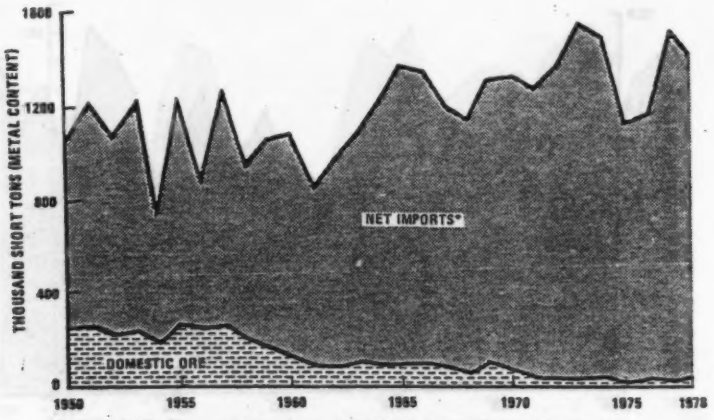


Figure 2-19. Price of cobalt, 1930 to 1978 (based on market price quoted by a major U.S. dealer).



*Net imports = imports minus exports of ore and processed materials, plus adjustments for changes in stocks.

Source: Bureau of Mines, U.S. Department of the Interior. Import-export data from the U.S. Bureau of the Census.

Figure 2-20. U.S. consumption of manganese, by source, 1950 to 1978.

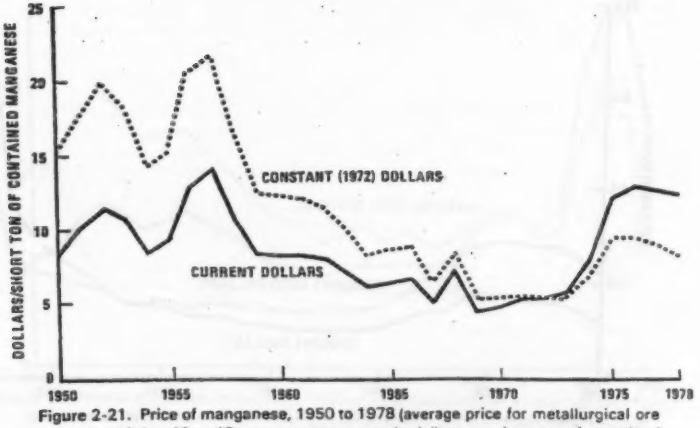


Figure 2-21. Price of manganese, 1950 to 1978 (average price for metallurgical ore containing 46 to 48 percent manganese, in dollars per short ton of contained manganese)